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Tetany in Welsh Mountain Ponies.

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One of us (W. H. S.) has, over a period of some twenty years, encountered an occasional case of the condition described by Harvey in 1923 (8). The subject of the case detailed in that article (Harvey, 1923) was a three-year-old pony mare which had led a wild moorland life until placed in a box on the 7th of May, 1923. She had foaled about one year previously and was still lactating. On the morning of the 8th of May some restlessness preceded the appearance of trismus, disturbed respiration and twitching of different muscles. When Harvey saw the pony late that afternoon she was in a critical condition—the clonic spasms were general, the jaws tightly closed, the masseters in a state of fibrillation, the neck muscles contracting and the limbs alternately straightened and drawn up. The heart's action was laboured, the breathing distressed, the body bathed in sweat and the temperature 102°F. The eyelids were drooping, and the pupils dilated. There was no protrusion of the *nictitans*.

This condition is not uncommon among Welsh Mountain ponies. Pony-owners of North Wales know it well and have called it "lock-jaw." They appear to have avoided making its existence known because, we think, they feared interference with their perfectly legitimate trade in these ponies.

During an influx of ponies into the Bangor district in October, 1928, the opportunity to observe five cases and investigate the nature of the condition arose. It was thought desirable to study this problem, not only from the clinical point of view, but also from a biochemical standpoint. Two of us (R. F. M. and W. H. S.) were responsible for the clinical work, whilst the third (E. C. D.) was responsible for the biochemical analyses.

General Observations.

Occurrence. Occasional cases are met in pony mares which have been removed from their foal and housed for as short a period as twelve hours. More commonly the disease appears among ponies which have been rounded up on their mountain or moorland grazings and taken a considerable distance (a journey of one or two days) by rail. They travel in cattle trucks which are often "sheeted" by tying a tarpaulin over the roof and the upper part of the sides. On arrival at their destination it is not uncommon to find one or two of each drove of about twenty affected. Mild cases may become advanced on turning out to pasture or may, we are informed, recover spontaneously.

Two of our recent cases were suckling mares, two were stallions and one a barren mare. Other similar ponies in the same truck loads were not affected. Three were found affected on arrival at Bangor station, the other two developing the disease after unloading.

Clinical Picture. Each pony has been seriously affected when first seen by us. Standing bathed in sweat, it could only move with great difficulty and uncertainty, the gait being stiff and jerky and the step short. Antagonistic muscles often appeared to contract simultaneously and co-ordination was partly lost. The general appearance did suggest the rocking-horse-like attitude seen in tetanus. The respirations were much accelerated and pumping in nature. A peculiar, almost putrid, odour of the breath was observed. The nostrils were widely dilated and the lower jaw so retracted that "parrot-mouth" was suggested. Fibrillation of the muscles, particularly over the masseter and shoulder regions, was obvious and trismus was always pronounced. The *membrana nictitans* could not be made to protrude on elevating the head. The tail was occasionally held a little away from the body. It was always freely moveable in all directions. The temperature was normal or but slightly elevated. A distinct thumping sound emanating from the chest and believed to be associated with contractions of the diaphragm was occasionally observed. Thirst was marked, but the ponies were unable to drink, despite repeated attempts to do so. The fæces were firm or rather hard. Frequently a pony would go down heavily and lie showing severe twitching of various groups of muscles. It was noted that although the sudden whistling of an adjacent railway engine produced no exaggeration of the symptoms, attempts to handle the animal frequently did.

Diagnosis. These symptoms appeared to justify a confident diagnosis of tetany. That the membrana could not be made to protrude and that the tail was flaccid, together with the history of the case and the symptoms exhibited—fibrillation, clonic spasms, etc.—served to differentiate it readily from tetanus.

Course.—Each of the earlier cases seen by W. H. S. terminated fatally within forty-eight hours of the appearance of serious symptoms. In each the spasms increased in severity until the convulsive state was general and almost without remission. The owner of the five recent cases has had a considerable experience of the condition. He asserted that mild cases quite frequently recover spontaneously. Of the ninety or so severe cases which he had seen some sixty died. He believed that spontaneous recovery was more common among suckling mares and declared that all his cases in stallions, approximately fifteen, had ended in death. He expected each of the cases here recounted, with the possible exception of the first, to terminate fatally. All five made a quick and complete return to normal, following treatment.

Treatment. Harvey's original case resulted in recovery following udder inflation. Our first case was similarly treated. In each of the others air was subcutaneously injected at a site high up over the ribs. Generally a foot bellows was employed and the injection continued until the subcutaneous tissue over the ribs, shoulder and lower part of the neck, on one side, was infiltrated with air.

The Five Recent Cases in Detail.

Case No. 1.

Subject. Aged Mountain pony mare in good condition which had recently been suckling a foal. On arrival at the station she was showing moderately severe symptoms (10 a.m., 11/10/28).

Treatment and Observations. Each quarter of the udder was milked out and inflated until tense by one duct only. Within half-an-hour she was able to walk to a field some 200 yards from the station. There she immediately attempted to graze, forcing her teeth into tufts of grass and prehending only a little, which remained between the incisors and the lips. The jaws could only be moved a little apart. The accumulated grass was removed several times and each further attempt to graze appeared to be rather more successful. At the third hour after inflation she was grazing well, but some of the grass tended to accumulate at the angles of the mouth. She moved freely and passed a quantity of hard, mucus-coated, fæces. Thereafter she made a complete return to normal.

Case No. 2.

Subject. Three-year-old Mountain pony stallion in moderate condition; a member of the same truck-load as the previous case. It was walked with others to a field about one mile from the station and there found seriously affected four hours later.

Treatment and Observations. A small quantity of air was subcutaneously injected, by means of a Higginson syringe. Three hours later, the pony being only a little better, a further injection, using the foot bellows, was made. On the following morning the stallion showed only some dragging of the toes and a curious snatching action in front. The jaws were freely moveable. Recovery was quite complete within twenty-four hours of the first injection.

Case No. 3.

Subject. Aged barren mare in good condition found down in the truck and seriously affected on arrival at the station, 5 p.m., 14/10/28.

Treatment and Observations. Subcutaneous injection of air was quickly followed by marked improvement and by 9 p.m. the jaws were quite free. Although the gait was still distinctly stilty, the mare walked to the field and by the following morning had made a complete recovery.

Case No. 4.

Subject. Aged pony mare with four-months-old foal at foot. On arrival at Bangor station about 11 p.m. on the 14th October, the owner noticed that she was breathing "hard" and that her gait was unsteady. She walked to the grazing and next morning was a moderately severe case of tetany.

Treatment and Observations. About 10 a.m. on the 15th, a blood sample having been obtained for analysis, a quantity of air was injected subcutaneously. Within an hour improvement was marked and at the fourth hour she was grazing and moving freely. There was some stertorous breathing and an occasional violent sneeze. That evening the pony appeared normal and next morning she walked with other ponies to a fresh grazing, a distance of about three miles. A second blood sample was obtained on the fourth day after treatment.

Case No. 5.

Subject. A six-year-old pony stallion in good condition which on arrival at the station, 4-30 p.m., 17/10/28, was very seriously affected. In attempting to evade haltering he fell heavily and was quite unable to rise.

Treatment and Observations. A sample of blood was obtained from the jugular vein and thereafter subcutaneous injection of air effected (5 p.m.). Only a little improvement was seen during the hour following treatment, but by 8 p.m. the pony was able to walk to pasture. At 9 p.m. it was walked a further distance of half-a-mile to a small stable and here a second sample of blood was taken, five hours after the injection of air. The pony showed some exacerbation of the symptoms while the sample was being taken. It went down heavily and the injection of air was again resorted to. On being assisted into the open it very quickly recovered and was driven out to pasture. It is noteworthy that the building was small, occupied by other stock and very stuffy. Next morning the stallion appeared to be quite normal.

Experiments.

To Test the Effect of Confinement.

Three pony mares grazing moorland pasture were taken from their six-months-old foals during the late afternoon of the 15th January, 1929, and placed in a large open shed. The "old" mare was nine years of age, the "grey" about five and the "young" one a three-year-old. On the following morning they were confined in a small unventilated brick built and slated shed, whose ill-fitting door was kept closed. There they remained forty-eight hours during which time they ate only a little hay and drank a small quantity of water.

A blood sample was obtained from each, from the jugular vein, before the commencement of the experiment, at the twenty-fourth, at the thirtieth and at the forty-eighth hour; the vein being raised for the purpose by tightening a cord placed round the base of the neck. In handling these ponies every endeavour was made to avoid unduly exciting them. Throughout the experimental period the weather was dry and cold with bright periods during the day.

While confined, none of these mares showed any marked abnormality but each, particularly at the thirtieth and forty-eighth hours, showed a distinct tendency to go down when the cord round the neck was tightened to raise the vein. In haltering some excitement was caused, occasionally accompanied by a regular thumping sound emanating from the chest. Owing to its transient nature it could not be determined whether this sound was associated with contractions of the heart or of the diaphragm.

On being turned out at the close of the experiment, each pony showed some stiffness in gait and in the "old" and "grey" mares an occasional muscular tremor over the shoulder region was observed.

To Test the Effect of Subcutaneous Injection of Air.

The three pony mares used in the foregoing experiment were taken into the open shed on the evening of the 30th of January, 1929. On the following morning they were placed in the small shed. The door was kept open. The day was damp and mild and the barometric pressure was low. A sample of blood was taken from each pony prior to subcutaneous injection of air after the fashion used in the treatment of our tetany cases. Further blood samples were obtained, from the "young" mare at 15 minutes and at two hours, from the "grey" at 30 minutes and at four hours, and from the "old" pony at one hour and at six hours after the injection of air. No clinical effect was observed.

Biochemical Observations.

Whilst it would appear that the condition under discussion has been proved to be tetany on clinical evidence, and therefore not lock-jaw, it was thought that the matter could be clinched by a careful chemical analysis of the blood. The fact that tetany resulting from parathyroidectomy is associated with low blood calcium is well known, and many conditions in which tetanic contractions of muscles have been observed are known to be associated with reduction in the calcium content. Some observers (MacCallum and Voegtlin (15) and (16)) have maintained that the reduction in the blood calcium content is definitely the cause of the tetanic symptoms and that the clinical syndrome of tetany does not appear until the calcium falls below 7 mgs. per 100 cc. In support of this view is the fact that experimental tetany can often be abolished by the cautious administration of calcium salts intravenously. Another group of workers (Koch (13); Paton and Findlay (18)) have described the accumulation of guanidine derivatives following parathyroidectomy, and have ascribed the symptoms to this body.

This investigation was confined to studying the variations in the calcium content of the blood of afflicted animals. Various forms of tetany are associated with a reduction of the calcium content of the blood, and from this it has been deduced that the parathyroid glands are at fault. It can readily be seen, however, that such a deduction is very unsafe unless direct histological evidence of a parathyroid lesion is obtained.

There is another well-established cause of tetany, namely, the production of an alkalosis. It will be remembered that the reaction of the blood is kept at a constant level by means of a series of buffers, of which sodium bicarbonate is probably the most important. This buffer system is known as the alkali reserve and it is possible to get considerable fluctations in this without any alterations of the hydrogen ion concentration of the blood. Thus an increase in the alkali reserve above normal without a change in the pH is called an alkalosis, whilst the reverse is termed acidosis. The best measure of the alkali reserve is to determine the CO_2 carrying power of the serum by Van Slyke's method, and this is expressed as cc. CO_2 under standard conditions carried by 100 cc. of serum. If the alkali reserve is increased it is found that there is an increased elimination of calcium from the blood and an increased amount in the urine. As the calcium content falls, so does the phosphorus rise. The biochemical findings, therefore, in a case of tetany due to alkalosis would be a low blood calcium and a high blood phosphorus with an increase in the alkali reserve. It will be seen that the ponies suffering from the symptoms already described possessed all the factors, thereby proving conclusively that the condition was a tetany in the biochemical sense of the word.

Blood Analysis. (See table, page 323.)

Normal Ponies. The analysis of the blood taken before the commencement of each experiment may be taken as that of normal blood. We would focus attention on the figures for:

(*a*) Before confinement. (*b*) Before injection of air.

Calcium:	(*a*) 12·8, 12·8 and 14·2	Average 13.
	(*b*) 12·4, 12·8 and 13	
Phosphorus:	(*a*) 3·5, — and 4·3	Average 3·33.
	(*b*) 2·7, 3·4 and 2·75	
Alkali Reserve:	(*a*) 57·4, 56·5 and 56	Average 64·9.
	(*b*) 78·7, 77·8 and 63·2	

A trace of bile was present in each sample.

Tetany Cases. In each sample taken before treatment remarkable departure from the normal was seen in the figures for:

Calcium: 5·2 and 6·1.
Phosphorus: 4·8 and 6·2.
Alkali Reserve: 84 and 86.

Bile was present in each sample, Fouchet's test being positive and the van den Bergh reaction delayed direct; indirect, strongly positive. It may also be noted that the urea and non-protein nitrogen figures were higher than normal.

In Case No. 4, blood taken four days after treatment gave normal figures except for alkali reserve which was still rather high. Bile was not present. Whilst the alterations in the figures for blood constituents were not very marked in the sample taken from Case No. 5 five hours after treatment, nevertheless they show a tendency to improvement. The blood calcium had risen from 6·1 to 7 mgs. per 100 cc., the phosphorus fallen from 6·2 to 5·5, the alkali reserve showed only a very slight drop and tests for bile were still strongly positive.

Confined Ponies. Despite some variation, the average figures showed a fall in calcium, arise in phosphorus and alkali reserve and the change from a trace of bile to a definitely positive reaction.

Air-injected Ponies. On analysis it was found that while the pre-injection samples gave values for calcium and phosphorus similar to those of the previous pre-experimental samples, the figures for alkali reserve were higher: 78·7, 77·8 and 63·2. In the post-injection samples the calcium content showed some tendency to fall slightly or remain almost stationary while the phosphorus content and the alkali reserve stayed at the "normal" level. It appeared that the injection of air had produced no effect that could be detected.

Discussion.

Harvey has recorded two cases of tetany in mares (8) (9), has evidently seen several others and has received reports from three veterinary surgeons who have met the condition in mares. It is possible that the "Fleeting Tetanus" of "Irish Vet." (12), Bray (2) and "Country

Vet." (3) was tetany. Williams (20) considers that the condition described under the title, " Parturient Eclampsia in the Mare," in his text book (19), corresponds with that seen by Harvey. It would seem that Williams was the first to describe the condition. Hutyra and Marek (11) do not mention tetany in the horse as we understand it. Wallis Hoare (10) saw a case in a mare which had recently foaled. His patient showed similar symptoms again while rearing her next foal.

With one exception these cases were encountered in mares with foal at foot. Since in the filly subject of the record by " Country Vet." the jaw movements were free and protrusion of the *membrana nictitans* pronounced, we hesitate in accepting this as a record of tetany. We have seen the condition in suckling mares, in one barren mare and in two stallion ponies. It cannot, therefore, be accepted as of the puerperal eclamptic group.

In each of Harvey's cases the mare had been running on poor pasture and the disease appeared soon after she was housed. Williams wrote (19, p. 610), " In nearly, if not all the cases I have related, the mares had been enjoying unrestricted freedom at pasture constantly since foaling, until taken up a few hours prior to attack, which was ushered in without warning." In the cases recorded by Bray and " Irish Vet." the mare appears to have been at pasture (protrusion of the *membrana* was recorded in each but Harvey (7) suggested that this might have been taken for granted). While the housing of a suckling mare has led to the appearance of tetany in Welsh Mountain ponies, the condition has been more frequently observed among ponies which have just reached the end of a railway journey. It would therefore appear that, whatever the predisposing influences, the confinement of these animals, normally running wild, is the determining factor.

It may well be that the ponies most liable to attack are those whose available calcium has been reduced by grazing deficient pastures and/or as a result of pregnancy and lactation. The excitement associated with handling, confinement, removal of the foal or a journey by rail would certainly appear responsible, at least in part, for the upset of metabolism which ushers in the attack of tetany.

Our investigations have shown that in these cases of tetany the blood calcium was very low, the phosphorus high and the alkali reserve figure above normal. The presence of bile pigments was also remarkable and the tests indicated that the jaundice was due to some cause other than biliary obstruction, the pigment being probably of hæmolytic origin. In so far as we know, no connection between tetany and such jaundice has been noted, and further work must be done on this problem. Otherwise, as has been pointed out, the cases described in this article possessed all the biochemical changes characteristic of tetany due to alkalosis.

In the human subject a similar state of affairs can be brought about by the excessive administration of alkalies, such as sodium bicarbonate, for various therapeutic purposes, and by prolonged vomiting attended by great loss of gastric acidity. There is also a definite group of cases caused by intestinal infections; this form is seen in the convulsions of children. Yet another variety is found: the hyperpnœa associated with the breathing of rarified atmosphere, as in ascending a mountain. The importance of hyperpnœa due to an increased temperature must also be mentioned here. It has been shown in man that hyperpnœa is attended with an alkalosis, this being due to the washing out of CO_2 from the blood, with the result that the alkali reserve becomes increased. It was shown by Bazett and Haldane (1) that if human beings were immersed in a hot bath at a temperature of 37°C. or over, there was hyperpnœa, faintness, mental confusion and tingling; the alveolar CO_2 tension fell in their experiments from 38·7 to 25·6 mm. and the hydrogen ion concentration of the urine was greatly diminished. Thus, one of their subjects passed urine with a pH of 9, containing no ammonia, but considerable quantities of bicarbonate and some acetone bodies. Although Bazett and Haldane do not push the conditions in their experiments to such an extent as to induce tetany, this has been recorded by other workers.

It is difficult to see in any of these factors one that could have operated in the ponies under consideration. Loss of acid from the body in the form of vomiting can at once be excluded, whilst there is hardly sufficient evidence to explain the condition by postulating an intestinal infection. It is possible that the crowded conditions under which the animals were moved might have produced an atmosphere so deficient in oxygen and so warm that hyperpnœa may have followed. It is, of course, extremely unlikely that actual anoxæmia played any part in the production of the condition, but it is quite possible that the warmth of the crowded trucks may have produced hyperpnœa similar to that obtained by immersing subjects in a hot bath. The mechanism for the production of tetany in this case has been discussed and it remains to be seen whether there is sufficient evidence in favour of excessive warmth as a cause of hyperpnœa and then tetany.

These ponies were small, 10 to 12 hands high, their heads did not reach the upper sparred portion of the sides of the truck and they travelled closely packed. The air of the truck would certainly become foul and very warm. Owners are much against the practice of sheeting the truck, for they believe that more cases occur in sheeted than in unsheeted loads. Again, one (or more) of the ponies may be crushed into a position from which it cannot extricate itself during part of the journey. Its head may be forced low into a corner or caught between the flanks of its fellows. In addition to the crowded atmosphere, the strange surroundings and continual frights would produce a condition of nervous excitement in the animals which, in itself, would tend to produce hyperpnœa. It is possible that this may explain the genesis of alkalosis and tetany, and the view is supported by the reappearance of serious symptoms in the pony, Case No. 5, which was taken into a stuffy building to be bled.

While it is difficult to see that the warm vitiated atmosphere played the major part in producing tetany when it appeared some time after unloading or in mares taken into a box, nervous excitement may then have been the important factor. It has been shown that the simple confinement of three mountain pony mares produced a departure from the normal blood analysis very similar to, but much less marked than, that seen in our tetany cases. It will be seen, therefore, that the hyperpnœa theories can only

PONY BLOOD ANALYSIS.

			mgs. per 100 c.c.							c.c. CO_2 %	
			Urea.	Non-Protein N.	Creatinin.	Chlorides.	Calcium	Phosphorus.	Cholesterol.	Alkali Reserve.	Bile.
Six "Normal" Samples.	Average values		32·1	27·4	1·4	520·8	13	3·33	84·6	64·9	Trace
	Highest values		42·6	30	1·5	556	14·2	4·3	136	78·7	—
	Lowest values		24·2	22·8	1·3	443	12·4	2·7	53	56	—
Tetany Cases	Case No. 4	Before treatment	64	42	—	—	5·2	4·8	—	84	Pos.
		4 days later ...	50	36	—	—	12·8	3·9	—	78·5	—
	Case No. 5	Before treatment	56·4	48	—	—	6·1	6·2	—	86	Pos.
		5 hours later ...	82	55	—	—	7	5·5	—	82	Pos.
Confinement Experiment	Old Pony	Before	42·6	29·6	1·5	531	12·8	3·5	120	57·4	Trace
		After 24 hours ...	34·7	25·7	1·5	462	13·6	4·5	122	73·9	Pos.
		After 30 hours ...	37·8	24·3	1·5	414	10	4·8	102	72·9	Pos.
		After 48 hours ...	34·7	28·6	1·7	456	10·2	5·7	111	68·1	Pos.
	Grey Pony	Before	29·5	30	1·5	525	12·8	—	—	56·5	Trace
		After 24 hours ...	40·2	28	1·4	462	12·4	4	150	76·8	Pos.
		After 30 hours ...	39·7	30	1·4	473	13·2	4	131	80·7	Pos.
		After 48 hours ...	37·3	31·7	1·5	438	11·6	4·1	142	80·7	Pos.
	Young Pony	Before	36·7	29·6	1·4	443	14·2	4·3	136	56	Trace
		After 24 hours ...	28·5	24·9	1·4	490	12·2	3·9	115	65·2	Pos.
		After 30 hours ...	37·8	23·2	1·3	462	12	4·1	120	70	Pos.
		After 48 hours ...	28·5	24	1·5	456	12	4·3	136	72·9	Pos.
	Average Values	Before	36·3	29·7	1·5	499·7	13·3	3·9	128	56·6	—
		After 24 hours ...	34·5	26·2	1·4	471·3	12·7	4·1	129	72	—
		After 30 hours ...	38·4	25·8	1·4	449·7	11·7	4·3	117·7	74·5	—
		After 48 hours ...	33·5	28·1	1·6	450	11·3	4·7	129·7	73·9	—

be regarded as a hypothesis, and more work must be done on this suggestion in order to determine the exact part played by these factors.

Our observations appear to have a particular interest in view of the Parathyroid Deficiency (Hypocalcæmia) Theory of the etiology of milk fever in cows enunciated by Dryerre and Greig (4). The researches of Little and Wright (14), of Dryerre and Greig (5) and of Fish (6) showed that the blood calcium of affected cows is much below the normal level. Tetany in ponies and milk fever in cows may not, however, be parallel conditions, since the characteristic secondary coma of the latter is not a feature of the former. Where death terminates a case of tetany in the horse the spasms continue to the end.

One suggestion offered as an explanation of the remarkable curative effect of intramammary injections of air in milk fever is that by arresting all lactation further loss of calcium is prevented and its reaccumulation in the blood permitted. Since the subcutaneous injection of air appears to act quite as efficiently as intramammary injection, this suggestion cannot explain the recovery of our tetany cases. Yet, while Dryerre and Greig (5, p. 724) have shown that mammary inflation will increase the blood calcium of normal lactating ewes about 10 per cent., we were unable to influence it in pony mares by the subcutaneous injection of air. Despite that evidence and since Maguire (17) has seen recovery in a case of milk fever following subcutaneous injection of oxygen, we are tempted to suggest that the injection of air, or oxygen, under the skin should be given an extended trial in the treatment of that disease.

SUMMARY.

1. A condition met among Welsh Mountain ponies, known to pony-owners of North Wales as "lock-jaw" and diagnosed as tetany, is described.

2. It has been observed in suckling mares soon after their being housed and in ponies of either sex which have just completed a journey by rail.

3. The subcutaneous or, in the mare, intramammary injection of air produced a rapid return to normal.

4. Analysis showed that the calcium content of the blood of affected ponies was very low, the phosphorus and alkali reserve figures high and that bile pigments, probably of hæmolytic origin, were present.

5. Simple confinement produced a similar, but much less marked, departure from the "normal" analysis in three pony mares.

6. Subcutaneous injection of air altered little, if at all, the chemical composition of the blood of three healthy ponies.

7. The part which hyperpnœa—resulting from the conditions under which the affected ponies had travelled—may have played in the genesis of alkalosis and tetany, is discussed.

It is a pleasure to acknowledge the assistance given by Mr. Lawson and Dr. Robertson, of the Biochemical Department, The Middlesex Hospital, in the very large number of analyses contained in this paper. The owner of the affected ponies was most helpful and the source of much information.

Postscript.

Since the foregoing was written two records of interest in considering the disease described above have appeared.

Davies, under the title "Railroad Disease" (*Vety. Jnl.*, Vol. lxxxv, p. 81, Feby. 1929), writes of a "mob" of cows, each having borne several calves and lived entirely at pasture and having been trucked a considerable distance, arriving at a New Zealand freezing works during the night. In the morning one was found dead, two were so seriously ill that they were immediately slaughtered, one was staggering about the pen—hocks extended and with the peculiar stiff gait observed in milk fever—and two, although down, were able to struggle to their feet only to blunder about the pen and go down again. Inflation of the udder produced a marked improvement—sufficient to get the patients to the slaughter pen.

Spicer (*Vety. Record*, Vol. ix., p. 178, March, 1929) spoke of some dozen out of fifty ewes with lambs of some age at foot "suffering from what was apparently milk fever" on completion of a journey by rail. They recovered after inflation of the udder.

References.

1. Bazett, H. C., and Haldane, J. B. S., *Proc. Physiol. Soc., Jour. Physiol.*, 1921, Vol. lv., p. iv.
2. Bray, M., *Vety. Record*, 1921, Vol. i., p. 454.
3. "Country Vet.," *Vety. Record*, 1921, Vol. i., p. 419.
4. Dryerre, H., and Greig, J. R., *Vety. Record*, 1925, Vol. v., p. 225.
5. Dryerre, H., and Greig, J. R., *Vety. Record*, 1928, Vol. viii., p. 721.
6. Fish, P. A., *Jour. Amer. Vety. Med. Assoc.*, 1928, Vol. lxxii, p. 10.
7. Harvey, F. T., *Vety. Record*, 1921, Vol. i, p. 426.
8. Harvey, F. T., *Vety. Record*, 1923, Vol. iii., p. 428.
9. Harvey, F. T., *Vety. Record*, 1928, Vol. viii., p. 1050.
10. Hoare, E. Wallis, "A System of Veterinary Medicine," 1913, Vol. i., p. 248.
11. Hutyra, F., and Marek, J., "Special Pathology and Therapeutics, etc.," 1926, Vol. iii., p. 506.
12. "Irish Vet.," *Vety. Record*, 1921, Vol. i., p. 360.
13. Koch, W. F., *Jour. Lab. and Clin. Med.*, 1915-1916, Vol. i., p. 229.

(*Continued at foot of next column.*)

Blood Phosphates in Milk Fever.*

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The work of Little and Wright,[1] confirmed in our laboratory,[2] and the work of Dryerre and Greig[3] have shown that there is a marked diminution in the amount of blood calcium in cows "down" with milk fever. It occurred to the writer that since calcium and the phosphates are intimately associated in many of the processes of body metabolism, the phosphates of the blood might also be affected.

Work along this line was begun in September, 1927, and, up to this time, 18 cases of milk fever have been tested. The results have been uniform in showing a subnormal amount of the inorganic phosphate and acid soluble phosphorus by the Fiske-Subbarow method prior to the inflation of the udder. In another investigation, we have found the average for the inorganic phosphates in normal milk cows to be 4.74 mg. per 100 cc. of serum, and for dry cows 6.45 mg.–100. The average of the acid soluble phosphorus for the milk cows was 7.95 mg.–100 and for the dry cows 9.23 mg.–100. The average of the inorganic phosphorus in the dry cows was 50 per cent. higher than that of the milk cows, and the acid soluble phosphorus was likewise higher, 16 per cent., than in the milk cows. The calcium content was found to be the same in both groups of animals.

The accepted remedy for milk fever is inflation of the udder. The effects are usually rapid, the animal recovering from its collapse or coma, and standing on its feet again, often within a period of 6–8 hours. The first blood sample was always taken just prior to udder inflation and the second sample, and occasionally a third sample, were taken at various intervals after inflation. In this way it was possible to determine approximately the time required for the phosphates to get back to their normal standard. The average of the preinflation sample for the inorganic phosphates for the 18 milk fever cases was 2.28 mg. per 100 cc. The average for the preinflation samples for the acid soluble phosphorus—17 cases—was 6.49 mg. Comparing these averages with the normal for the milk cow, it is found that there is in the inorganic

[1]Little and Wright, *Brit. J. Exp. Path.*, 1925, vi, 129.
[2]Fish, P. A., *J. Am. Vet. Med. Assn.*, 1928, lxxiii.
[3]Dryerre, H., and Greig, R., *Dumfries and Galloway Vet. Med. Assn.*, July 7th, 1928.

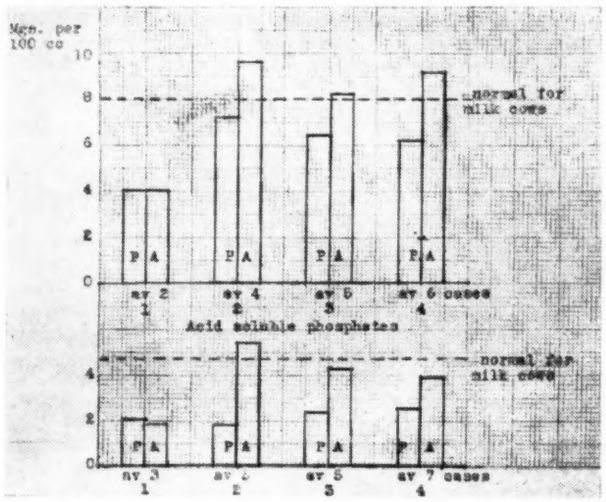
* Reprinted from the *Proceedings of the Society for Experimental Biology and Medicine*, 1929, xxvi, pp. 387-389.

(*Continued from previous column.*)

14. Little, L. C., and Wright, N. C., *Brit. Jour. Exper. Path.*, 1925, Vol. vi., p. 129.
15. MacCallum, W. G., and Voegtlin, C., *Jour. Exper. Med.*, 1909, Vol. xi., p. 118.
16. MacCallum, W. G., and Vogel, K. M., *Jour. Exper. Med.*, 1913, Vol. xviii., p. 618.
17. Maguire, L. C., *Vety. Record*, 1926, Vol. vi., p. 52.
18. Paton, D. N., and Findlay, L., *et al. Quart. Jour. Exper. Physiol.*, 1916, Vol. x., p. 203.
19. Williams, W. L., "Veterinary Obstetrics," 1917, p. 605.
20. Williams, W. L., *Vety. Record*, 1921, Vol. i., p. 598.

phosphates a decrease of about one-half in the milk fever cases, and but a moderate decrease in the acid soluble phosphorus.

The effect of udder inflation upon the rise of the blood phosphates is indicated in the following graphs:



Inorganic Phosphates.

P = preinflation tests. A = tests after udder inflation. In graph 1, A = 10—20 minutes after inflation. In graph 2, A = 6—8 hours after inflation. In graph 3, A = 10—18 hours after inflation. In graph 4, A = 24—36 hours after inflation.

The time periods refer to both inorganic and acid soluble phosphorus.

The height of the preinflation tests in the graphs does not represent the average of the total number of cases, but the average for the number of animals in each specific group. In the first group, 10–20 minute period, it is very desirable to test a larger number of animals before accepting the slight decrease in the amount of the phosphates as a constant feature.

As a general conclusion from a study of the graphs it would appear that there is a continued slight decrease in the amount of the inorganic phosphates for 10–20 minutes after inflation; but that in the 6–8 hour period they have risen to normal or a little over, with a slight decrease below normal in the 10–18 and 24–36 hour periods. The acid soluble phosphorus shows a somewhat similar rise and fall for the same periods except that in the 10–20 minute period the amount was about the same as in the preinflation tests and the fluctuations in the subsequent periods were all a little above the normal.

Whether the diminished amount of the phosphates is correlated with the decreased amount of calcium in the blood of the milk fever cases or whether the decrease of each is independent of the other, or whether the calcium or the phosphates may be the more important factor in the phenomena associated with the disease, cannot be stated at the present time.

In our experience the blood calcium requires a considerably longer period than the phosphates to reach its normal standard. It is perhaps significant that the recovery of the cow seems to be coincident with the return of the blood phosphates to their normal standard.

Colonial Advisory Council of Agriculture and Animal Health.

MR. ORMSBY-GORE'S OPENING STATEMENT.

At the first meeting of the Council, which was held at the Colonial Office on 24th March, 1929, the Rt. Hon. W. Ormsby-Gore, M.P., who is acting temporarily as Chairman, made the following statement:—

I have first to welcome you as members of the Council which the Secretary of State for the Colonies has established to advise generally upon questions relating to agriculture and animal health in the non-self-governing Colonies and Dependencies. The Council has been appointed in accordance with the recommendations submitted by two Committees over which Lord Lovat presided, the one on the organisation of a Colonial Agricultural Service and the other on the Colonial Veterinary Services. We have received no detailed terms of reference, but the functions which it is proposed that we should perform follow, in general, those recommended by the two Committees. Our duty is to advise both the Secretary of State and Colonial Governments on any problems connected with agriculture or animal health that may be referred to us, and to be available for consultation on any matters on which our help and assistance are required.

Let me say a few words about the personnel of the Council. As I think you have all been informed, my appointment as Chairman is only temporary; but it seems to me that, unless some layman from outside who is familiar with our problems is available, the Parliamentary Under-Secretary of State for the Colonies for the time being should normally be Chairman. Our Vice-Chairman is Mr. Stockdale, who assumed duty here on the 1st March as Assistant Agricultural Adviser to the Secretary of State. Mr. Stockdale's first appointment, in 1905, was that of Mycologist and Lecturer in Agricultural Science in the Imperial Department of Agriculture in the West Indies. He was promoted Assistant Director in British Guiana in 1908, and in 1912 went from there to Mauritius as Director of Agriculture. Four years later he was appointed Director of Agriculture in Ceylon, where he stayed until last year. During his twenty-three years' service in the tropics Mr. Stockdale has had to deal with a great variety of crops and conditions, and we can congratulate ourselves that his knowledge and experience are now at our disposal.

In his invitations to you to serve on the Council the Secretary of State followed, in the main, the recommendations of the two Committees. It should, however, be understood that all the members of the Council serve in their personal capacity and not as Directors of this or that institute, and their successors in office will not necessarily succeed them on this body.

The membership of the Council is at present being kept as small as possible, but it will no doubt be necessary for additions to be made to it from time to time, and we have been given the power of co-opting members as required. It is not proposed that steps should be taken yet to appoint the two Committees of Agriculture and of Animal Health, on whom it was anticipated that the main work of the Council would fall, but I have no doubt that these Committees will be found necessary in the future.

I do not think I need refer in detail to the sequence of Committees which, in the past few years, have studied questions relating to Agriculture and the Agricultural Services in the Colonial Empire. It will, however, be necessary for us to take all the reports into consideration and to keep them in view during our discussions.

In all three reports recommendations were made for the establishment of an Advisory Council and a similar recommendation was made in the report of the Veterinary Services Committee. The Committee on the organisation of a Colonial Agricultural Service recommended the establishment of a Council and the appointment of a Chief and Assistant Agricultural Adviser to the Secretary of State as the first step to be taken before the inauguration of the unified Service. Twenty-one out of the twenty-six Dependencies, or groups of Dependencies, which were

asked to co-operate in the establishment of the Council, have so far agreed to do so, and a start has now been made by the appointment of Mr. Stockdale as Assistant Agricultural Adviser, and by the constitution of this Council. As you know, the appointment of Chief Agricultural Adviser is being left unfilled for the time being.

The report of the Colonial Veterinary Services Committee has only recently been issued, and a Circular despatch is shortly being sent to Colonial Governments containing the Secretary of State's views on the Committee's recommendations. It is proposed that the first step to be taken on the report is to initiate, without delay, the scholarship scheme which the Committee have recommended for the training of veterinary officers, and it is hoped that the necessary support will be forthcoming to make this possible.

The appointment of this Council marks another stage in our efforts to assist Colonial development. The Secretary of State has already appointed similar bodies to advise him on questions affecting medical research and public health, and on education, namely, the Colonial Medical Research Committee and the Advisory Committee on Education in the Colonies. We shall, I hope, be able to make full use of the experience which those Committees have already gained, particularly in regard to the question of the dissemination and interchange of information. This is one of the most important subjects on which our advice will be desired, and we will have to consider how best to supplement and co-ordinate the work of the Imperial Bureaux of Entomology and Mycology and of the eight new Imperial Bureaux which are being established as a result of the recommendations of the Imperial Agricultural Research Conference which was held in London in 1927. I may perhaps mention that so far nineteen Colonial Governments have agreed to contribute towards the cost of the establishment and maintenance of these new Bureaux, and that we know already that £2,495 will be forthcoming towards the £3,750 which the Colonial Empire as a whole was asked to contribute annually. The Secretary of State has appointed Mr. Vernon to represent the Colonies generally upon the Executive Council of the new Bureaux, and Mr. Stockdale will act as the official correspondent with all of them for the Colonial Empire.

Another point which the Council will have to consider later is that of periodical reviews of agricultural research work and developments in the Colonial Empire. I would like to take the opportunity of referring here to the report of the Royal Commission on Agriculture in India. This report is, as you know, one which deserves the fullest study both by, and on behalf of, Colonial Governments, in view of the close relation of many of the problems which confront India and the Colonies, and Mr. Stockdale proposes to put together a short review of the report, in which he will bring out those points of special interest to the Colonies. This will be printed and circulated to Colonial Governments.

If I may refer also to some other questions on which our advice will probably be required at some stage, there is, first of all, the policy of the proposed chain of Central Research Stations. A further general review of the situation is desirable and suggestions might be put forward as to the lines on which further development should take place. Progress in this direction cannot be rapid, as the supply of workers is limited, but we can, I think, claim that a good start has been made with the East African Agricultural Research Station at Amani.

The Empire Marketing Board have arranged for Mr. Engledow, of the School of Agriculture, Cambridge, to visit Trinidad next month and advise on several matters concerning the Imperial College of Tropical Agriculture, particularly in regard to the rôle it should fill as (*a*) the training centre for the Colonial Agricultural Services (*b*) a link in the Imperial chain of Research Stations, and (*c*) its duty towards West Indian agriculture. It seems to me that the College, as the main higher training centre for the Colonial Empire, is the pivot on which future agricultural development turns, and that we should do all in our power to help and assist its work.

Then again, there are the non-Government research institutions. During my recent tour in the East I studied the work being done by the Departments of Agriculture in Malaya and Ceylon, and I was also able to see something of the research work which, side by side with that of the local Departments, private agricultural enterprise was fostering. . . . Various forms of such research are being undertaken in several Dependencies; it will be for us to advise as to the work which is best suited to each Dependency and as to the allocation of research programmes in such a way as to avoid overlapping and unnecessary duplication of effort. There is also the work on Animal and Human Nutrition now being conducted in Kenya in collaboration with the Rowett Research Institute at Aberdeen. Various proposals for further development are under consideration and Dr. Orr is, I know, anxious that these should be reviewed by this Council at an early date.

The Council will also be asked to review the general proposals for the unification of the Colonial Agricultural Services in the light of the criticisms and observations which have been submitted by several Colonial Governments. The question is one of considerable complexity, but unification is the ideal to be aimed at and, in principle, has been generally accepted. It will, however, be very necessary for us to give most careful thought and consideration to the difficulties which surround its inauguration.

On a very large number of matters it will be necessary for us to work in the closest harmony with the Empire Marketing Board and its Research Grants Committee. The Board have been remarkably generous in the assistance which they have willingly given towards the prosecution and development of research in the Colonies, and through them we shall be able to keep in touch with some of the research work which is being done in other parts of the Empire.

I should like to refer also to the Colonial Office Conference and the Imperial Agricultural Research Conference, both of which met for the first time in 1927, for I think that this Council will be expected to play some part at future Conferences of this character. For instance, at the next Colonial Office Conference I imagine the Council will be asked to present some review of Colonial agricultural development. This Second Conference will probably take place some time next year. As you may know, I myself wrote a paper for the 1927 Conference, but something fuller and more up-to-date will clearly be desirable next time. Further, the question of the unified Agricultural Service will doubtless come before the next Colonial Office Conference and further decisions may be taken there as regards its future progress.

In connection with the Imperial Agricultural Research Conference, which holds its next meeting in Australia in 1932, it would, I think, be desirable to take early steps to organise some form of Colonial Group through which the individual Colonies can take a more leading part in the work of the main Conference than was possible in 1927. The suggestion has indeed been made that before the main Conference meets in Melbourne a Colonial Agricultural Conference, at least for the Tropical Dependencies, should be held, and this proposal will have to be examined in due course.

I would wish to express the deep gratitude which we all owe to Lord Lovat, who, as Chairman of successive Committees, has rendered such invaluable services to the Colonial Empire. We all regret his temporary retirement from public life, and we hope that he may soon be restored to health again and resume his many activities.

Finally, I should like to take this opportunity of placing once again on record my own opinion that the future prosperity, not only of the Colonies themselves, but also of Great Britain depends very largely on the increasing application of the results of scientific research to the

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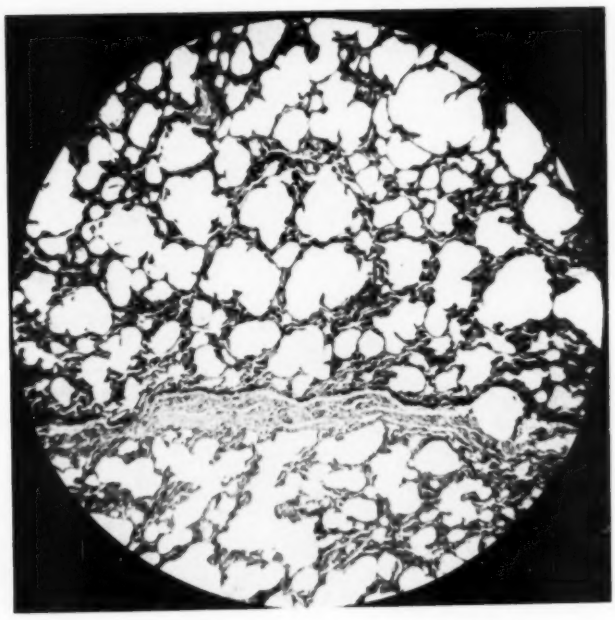

FIG 1.

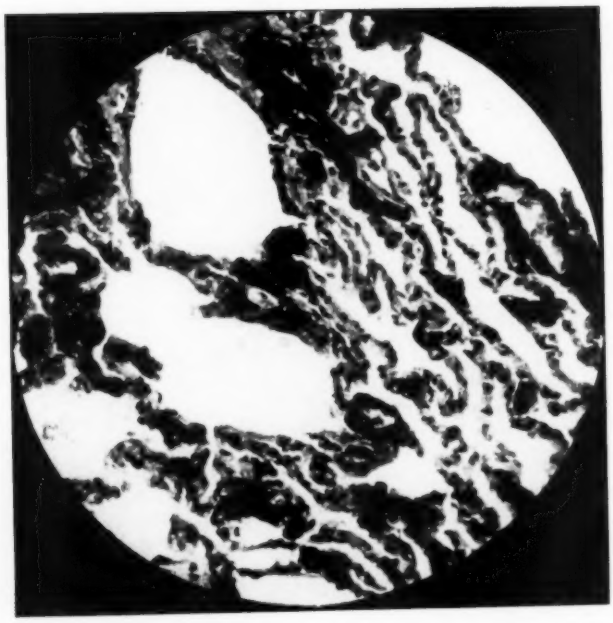

FIG. 2.

CLINICAL AND CASE REPORTS.

Melanosis.

By H. A. Cookson, M.B., F.R.C.S.E., D.P.H.(Cantab.), Pathologist and Bacteriologist to the Sunderland Royal Infirmary and Children's Hospital, Bacteriologist to Sunderland Corporation, etc., Examiner in Public Health, Edinburgh Royal College Surgeons and D.P.H., Edinburgh Royal College of Surgeons.

Melanosis, while it occurs most commonly in cattle and calves, is also seen from time to time in sheep and hogs.

The condition may be generalised, or confined to a single organ, such as the lungs. In the more generalised forms there is a great incidence on the connective tissues of the body.

The writer wishes to record two cases of this disease, and to illustrate the same with micro-photographs showing the pigment and the curious lines of demarcation between the pigmented and non-pigmented areas. See Fig. 1.

Further, he ventures to append a Bibliography on this condition. In case 2, there was no generalisation of the condition—areas of the spinal cord only being affected.

Case 1.

A heifer, three years old and apparently in good condition, the animal's dead weight being 736lbs.

Right and left lungs were affected, both in the substance of the lungs and also the pleuræ. The pigment was deposited in large patches about the size of a five-shilling piece, the line of demarcation from the surrounding tissue being very sharp.

The bladder showed rounded areas the size of a shilling and in the peritoneum, adjacent to the kidneys, were scattered pigmented areas of blackish pigment looking like greyish fleecy clouds. The spinal cord was markedly affected, as were the membranes covering it.

The carcase was condemned.

Case 2.

A cow about six years of age, with a dead weight of 690 lbs. The animal was in poor condition.

Here the only evidence of melanosis was in the spinal cord and canal. Only very small portions of the cord showed a normal colour. The carcase was condemned. I venture to think that the incidence on the spinal canal is interesting in these two cases. There was no glandular involvement in either case.

I have to thank Dr. Hebblethwaite, Medical Officer of Health for Sunderland, for access to the material in these cases, and Mr. Howard, Meat Inspector to the Sunderland Corporation, for his help and interest in the matter.

Bibliography.

Perroncito, E.—"Melanotic tumour in the ox."—"Pulmonary melanosis in the ox and goat." (Tumeur mélanique du boeuf). (Mélanose pulmonaire du boeuf et de la chèvre). *Rec. Méd. Vét.* Vol. xcv, No. 6. 30th March, 1919. *Bull. Soc. Centr. Méd. Vét.* 20th March, 1919. p. 118. *Veterinary Review*, August, 1919. Vol. 3. No. 3. (Brief extract).

Boyd.—"Melano-Sarcoma of the cow in which good results were obtained by surgical interiference." *The Cornell Veterinarian*, Vol. 8, No. 2. April, 1918, pp. 125—6.

Pickens, E. M.—"Generalised Melanosis in a pig." *Journ. Amer. Vet. Med. Assoc.*, Vol. lii. No. 6. Feb., 1918, pp. 707, 713.

Pérès, G.—"Notes on a case of melanotic tumour" (Quelques notes sur un cas de tumeurs melaniques).—*Rev. Gén. Méd. Vét.*, Vol. xxvi, No. 308. Aug., 1917, pp. 364—365.

Goldberg, S. A.—"The differential features between melanosis and melano-sarcoma." *The Journ. Amer. Vet. Med. Assoc.* Baton Rouge. La.—Vol. lvi. No. 2. Nov., 1919, pp. 140—153, Ibid. No. 3. Dec., 1919, pp. 250—264.

Burnett, S. H.—"Melanotic sarcoma and so called melanosis." *Journ. Amer. Vet. Med.*, Washington, D.C. Vol. lvii. No. 4. July, 1920, pp. 480—481.

Mettam.—"Ochronosis and Melanosis, etc." *Vet. Journ.* Jan., 1910, p. 8.

Gilruth. "Melanotic infiltration of the hepatic cells in sheep." *Vet. Journ.* July, 1910, p. 390.

Walley's "Meat Inspection" (Stockman). "Melanin."

Edelman, Mohler and Eichhorn's "Meat Hygiene." Pigment formation.

Pick.—"Ochronosis." *Berl. Klin. Wchnschr.*, xliii., 478, 509, 556, 591.

Poulsen.—*Zieglers Beitr.*, 1910, xlvii, 437 (bibl.).

Sewell, E. J. H.—"A striking case of generalised melanosis in a bullock." *Veterinary Record*, 22nd September, 1928.

Ostertag.—"Pigmented Deposits" (Melanosis, Ochronosis, Xanthosis and Brown colouration of the skeleton). Handbook of Meat Inspection, 3rd Edition, 1907, pp. 252—254.

Hueck, W.—For a general survey of these pigments—Zieglers Beitr., 1912, liv. 68, and Oberndorfer, Lubarsch-Ostertag, Ergebn. d. Allg. Path.—1908, xii, 466.

Hall, V.—"Imbibition Pigmentaire, etc." Traité, d'Anatomie Pathologique générale—Vigot Frères. Paris, 1924, p. 20.

Dawson, Dr. J. W.—"The Melanomata, their Morphology and Histogenesis," *Edinburgh Medical Journal*, Oct., 1925.

(Continued from previous page.)

problems of agricultural development. Though there are still large gaps in our knowledge which we must endeavour to find the best means of filling, there is a vast amount of experience not merely in the British Empire, but in other Colonial Empires, and in the Universities and research centres of the whole world, which could be rendered more available to producers and workers if only that experience was more generally appreciated and widely known.

It is to the desire of the Secretary of State that the Colonial Office shall make itself ever more useful to all communities in the Colonial Empire that this Council owes its origin. We therefore hope that a long career of useful work is before it, and that it will earn the regard and appreciation of all who have the welfare of the Colonies at heart.

Milk Fever in the Cow and Eclampsia in the Bitch.

By Arnold Spicer, F.R.C.V.S., Oxted.

March 16th.—A farmer came in at 4 p.m. to say that his cow had gone down with milk fever and my assistant called and inflated the udder. He saw the cow again at 11 p.m., when there was no improvement and she was still in a comatose condition. He inflated her again and gave a drench containing one ounce of chloral and left another to be given in two hours' time.

March 17th.—The farmer called my assistant at 6 a.m. to say that the cow was still in the same condition and the latter came round to me to know what he should do, as it appeared to be one of those cases which would not

respond to inflation. I suggested a subcutaneous injection of normal saline. Accordingly, rather over a pint (all that was ready in the surgery) was injected into the right side of the neck. At eleven o'clock we both called and I injected three pints into the left side and there would have been no trouble in injecting a half gallon if it had been necessary. On turning the cow over, she was able to keep herself up on her sternum and eat a little hay. In the afternoon she was sitting up and was quite comfortable, feeding well.

March 18th.—In the morning the cow stood up for about twenty minutes and then lay down. She did not get up again and the farmer came in at 11 p.m. as he was getting nervous. She was inflated again.

March 19th.—The cow was still down, but resting comfortably and feeding, and the same in the afternoon. She received nux vomica powders during the day.

March 20th.—The animal was up when they came to her in the morning and gave no further trouble.

There is a certain number of cases of milk fever that do not respond to inflation of the udder and it is difficult to suggest a satisfactory method of treatment in them.

This case is reported in the hope that normal saline may prove a useful adjuvant when one has reached the end of one's tether.

ECLAMPSIA.

CASE I.—*Subject*—A Cocker Spaniel bitch, with five puppies a month old.

March 17th.—This dog had been seen by a registered practitioner at eleven o'clock, and the case diagnosed as hysteria and a stimulant given.

I was called in and saw the bitch at two o'clock. All her milk had gone, she was lying on her side panting, unable to stand, and could only scramble about dragging her hind legs after her. If she was lifted she could not hold her head up. Temperature 105°F.

She received 150 cc. normal saline subcutaneously and 20 grains of potassium bromide and was to have 10 grains every two hours. The owner arranged to report at 6 o'clock p.m. At that hour the owner rang up to say that the bitch was normal; the milk returned and she gave no further trouble.

CASE II. *Subject*—A Cocker Spaniel bitch, with six puppies, about four weeks' old.

March 27th.—She had been showing symptoms for about an hour, when seen. She was lying on her side panting, unable to stand, temperature 104°, and there was no milk in the gland.

She received precisely the same treatment and was practically normal in four hours after the injection.

The milk came back the next day and the bitch did well.

Milk Fever a Fortnight after Calving.

By J. CAMERON, M.R.C.V.S., Berwick-on-Tweed.

In view of the paper by Mr. Spicer, recently published in the *Record*, and Mr. Stinson's letter commenting on it, I should like to record a case I had last week.

The subject was a two-year-old Galloway heifer which had been wintered outside with no extra feeding except a little good hay daily. The heifer calved outside and with-

(*Continued at foot of next column.*)

ABSTRACTS.

[Bacillus Aertrycke—The Possible causative bacillus of Canine Typhus (Stuttgart Dog Disease). MANIFOLD (Major J. A., D.S.O., R.A.M.C.). *Jl. R.A.M.C.*, Dec., 1928. Vol. 57. No. 6, pp. 402—409].

The mortality among dogs in India is high and it appears to be higher among those born in England. The view is commonly held that "tick fever" is the cause of death in the majority of cases; at least, this is generally the diagnosis made by someone "who knows something about dogs."

"It is not the intention of the writer to decry the 'unqualified dog practitioner,' as many take up this line of work owing to their natural liking for dogs . . . but it stands to reason that differential diagnosis in such cases must frequently be unscientific and of a rough and ready description."

During 1926 Major Manifold examined a number of blood films from dogs thought by their owners to be suffering from "tick fever," but failed to find any piroplasms.

The symptoms, as described by owners, appear to fall into two groups.

In the less acute cases fever, thirst, and vomiting are not very marked, but there is great weakness and wasting. These symptoms persist for about a fortnight, and if improvement occurs there is great debility left and animals are likely to become covered with sores. Ulceration of the mouth may or may not be a prominent symptom.

In the more acute cases, symptoms of gastro-enteritis are more severe. Vomition, abdominal pain and ulceration of the mouth are prominent. Death generally takes place in a week.

The author had the opportunity of examining two lots of fæces from hounds suffering from the milder form of the disease and in one case an almost pure culture of *B. ærtrycke* was obtained.

As this finding agreed with the clinical picture, some pariah dogs, which it was thought might be carriers, were shot and their sera were tested by agglutination with the strain. In one case agglutination was obtained at 1 in 125 and in the other 1 in 50. Transfer to another station prevented the author from pursuing the subject, but the strain was tested by another officer of the R.A.M.C. against specific sera of the Salmonella group and it was found to be agglutinated only by *B. ærtrycke* serum (the titre is not given). A. L. S.

(*Continued from previous column.*)

out assistance on March 18th and was allowed to suckle the calf, and remain out.

On April 1st it was found lying in the field and unable to rise. It was removed, on a rick lifter, to a shed.

When I examined the animal some hours later it was lying in a comatose condition with a temperature of 98.5°F. and presented a typical clinical picture of milk fever. The udder was inflated and the animal propped up on its brisket. Next day it was much brighter and commenced to eat. A laxative drink was given.

Two days later it was on its feet and nursing the calf, and appeared perfectly normal.

[Researches on Bacillus Calmette-Guérin and Experimental Vaccination against Bovine Tuberculosis. WATSON (E. A.), MCINTOSH (C. W.), and KOUST (H.). *Jl. Am. Vet. Med. Assoc.*, Vol. 73. No. 7. Nov., 1928, pp. 799—816].

Watson and his collaborators point out that, in connection with the use of B.C.G. Vaccine, two questions require answers. Is it safe ? Is it efficient ?

These questions carry subsidiary questions with them. Is the vaccine absolutely non-pathogenic ? Are vaccinated animals, either before or after exposure to natural infection, free from all suspicion of being a danger to other animals ? Is the harmlessness that is claimed for the vaccine a really fixed character, or may virulence be reacquired under natural conditions or through artificial cultivation ? What is the ultimate fate of the bacilli contained in the vaccine ? What modifications may take place after long sojourn in the vaccinated animal or after passage from animal to animal ?

Chief among the subsidiary questions that arise regarding the efficacy of the vaccine are the following. To what extent, if any, is the power of resistance increased ? Does it prevent animals from becoming infected subsequently or enable them to tolerate such infection without harm ? The strains of B.C.G. used in the experiments were obtained from the Pasteur Institute at Lille (number 80) and from Professor Calmette (number 17).

The authors realised, of course, the absolute necessity of taking every precaution that the cultures used for the vaccines were absolutely pure and they are satisfied that no contamination of any kind occurred throughout the tests. Between January 1925 and May 1927 fifteen experiments, involving the use of 134 guinea-pigs, have been carried out. Of these, seven died of tuberculosis, five were found to have generalised tuberculosis and 30 to have slight or localised infections when they were killed, and in the remaining 92 no lesions of tuberculosis could be found. That is to say, 68 per cent. showed no lesions, 22 per cent. showed slight lesions, some of which appeared to have become arrested, while others appeared to be quite active, and 9 per cent. showed extensive generalised tuberculosis.

The majority of the tests which have been carried out by other investigators have involved the *post-mortem* examination of the guinea-pigs used, at intervals of five months or less, after inoculation. The authors of the present paper have kept their animals for longer periods than this, and, as they point out, therein lies one of the possible explanations of the disagreement between their results and those of others. In the first experiment, for example, the two guines-pigs which survived the longest died about 18 months after inoculation, one from tuberculosis and the other from some other cause apparently free from tuberculosis. From a tabular statement summarising the results of the experiments with guinea-pigs, it may be gathered that the average duration of life (including those which died and those killed) of the animals in which no evidence of tuberculosis could be found was 295 days. In the case of the 30 guinea pigs showing slight tuberculosis it was 290 days, and the twelve guinea-pigs which actually died of tuberculosis survived for an average period of 309 days.

Material from some of the guinea-pigs has been used for further inoculations in series and these passages have exalted the virulence so that typical tuberculosis and death results. The authors state that they can definitely eliminate any possibility of naturally-acquired tuberculosis among their test animals. For many years every animal dying from natural causes or by accident in the breeding houses has been subjected to *post-mortem* examination and no case of natural infection has ever been found. It has further been recorded by the authors that normal healthy guinea-pigs placed as controls in cages with tuberculous guinea-pigs always appear to escape infection. To eliminate any conceivable risk the guinea-pigs used in eleven of the experiments were housed in a special building away from all others.

From these experiments the authors draw the following conclusions :—

1. B.C.G. vaccine is not entirely deprived of virulence, nor is it innocuous to all animals, particularly the guinea-pig.

2. Virulence is a latent property of B.C.G., requiring some special stimulus, and, especially, time to awaken it to activity.

3. It is capable of causing in some guinea-pigs, after a long period of infection and tolerance, a progressive and fatal tuberculosis, which then becomes re-inoculable and transferable from animal to animal in serial passage.

Experiments have also been carried out with calves involving the use of 14 vaccinated and three controls. The calves were obtained from tuberculin-tested cows in accredited herds very soon after birth and were segregated at the Government Experimental Farm, Ottawa. They were fed upon milk from tuberculin-tested cows until after vaccination. Vaccination was carried out at four to seven days from birth. A week later the calves were taken to a segregated herd of cows reacting to tuberculin and were fed up to five or six months on milk from this herd. After this they were pastured and stabled with reacting animals until killed at periods ranging from one year and three months to two years and one month.

Five calves were given 75 mg. of B.C.G. and one control was kept unvaccinated. When the six were slaughtered at 15 months all had definite lesions, typical of the early stages of tuberculosis and involving one or more of the following organs or glands—retro-pharyngeal, bronchial, mediastinal, mesenteric glands and the lungs. The lesions in the control and one of the vaccinated calves were practically identical and comprised caseating lesions in the bronchial glands only. The lesions in the other four vaccinated animals were more extensive.

In the second group of five, two were given 75 mg. of vaccine as in the first group, but slaughter was postponed for some months. The other three were given a second dose of vaccine (100 mg.) at one year old. One control was unvaccinated. In all six animals the bronchial and mediastinal glands were tuberculous and in four there was also tuberculosis of the lungs. The lesions of one calf (twice vaccinated) were typical of active progressive tuberculosis. Guinea-pigs inoculated from lesions of all these calves developed generalised tuberculosis.

Eight calves were given 100 mg. B.C.G. at four or five days old, and two of these were revaccinated at 13 months

old with 75 mg. Four of these and a control were killed at 21 months and the remainder were still alive at the time of reporting.

At *post-mortem* examination all the calves were found to be infected, and the lesions were comparable to, but more extensive and more active than, those found in the preceding groups. One calf had developed generalised tuberculosis involving the bronchial, mediastinal, retro-pharyngeal, prepectoral, portal, and mesenteric glands, and the lungs.

The groups of calves were all exposed to the same sources of infection, but the exposure of the third group was ten months later than that of the second.

The whole picture is one of slowly progressive tuberculosis and typical of the naturally contracted disease in young animals. Comparing, as far as is possible, the results obtained with the 14 vaccinated animals and the three unvaccinated controls it would appear that there is nothing in favour of vaccination nor evidence of any increased resistance. Further, it is apparent that a vaccinated animal living in an infected environment becomes a carrier of pathogenic tubercle bacilli—as shown by guinea-pig tests—which are not less virulent than those of non-vaccinated controls. In their discussion of the results the authors point out that, as originally planned by Calmette and Guérin, B.C.G. vaccination was to be carried out without in any way modifying the procedure in use on infected farms. The vaccine was to be used within a fortnight of birth, and was to be repeated annually.

An important modification of this plan has, however, been introduced by Calmette and Guérin. Calves are to be isolated, fed only upon boiled milk, and protected against possible infection for a month after vaccination. This condition reduces considerably the "simplicity" claimed for the method.

Watson has now a new series of calves under experiment and the new condition of isolation and feeding on boiled milk has been introduced.

The general conclusion arrived at is that B.C.G. vaccination is still in the experimental stage and that its innocuity and efficiency are open to question.

A.L.S.

"We have heard a lot of late of gland-grafting, thyroid and ultra-violet ray treatment of the sensitive modern racing thoroughbred and sire who is not denied any of the costly advantages of modern scientific research," says *The Sporting Times*. "In that connection Lord D'Abernon is more than hopeful that the leading veterinary authorities will not have, through lack of funds, to 'borrow' so much from the discoveries for human beings, but that the Tote may supply them with the money for intensive research on subjects which specially affect the horse."

. . . . . .

In a lecture at Whitchurch (Shropshire) to the local branch of the Farmers' Union, Professor Share-Jones, President of the Royal College of Veterinary Surgeons, said that it was not until 1922 that any real attempt appeared to have been made to estimate the value of our live stock. In that year a Committee, which was dealing with the subject, gave as its estimate of the value of our cattle, sheep and pigs £400,000,000 to £450,000,000. It further estimated that we lose in a normal year approximately £5,000,000 worth from causes that are preventable.

REVIEW.

The Shire Horse Society, 1878 to 1928.

The Council of the Shire Horse Society has commemorated its Jubilee by the publication of a very handsome and beautifully illustrated official record of its history and progress. The volume is the handiwork of Mr. A. B. Charlton, who has been associated with the Society for forty-two years, first as Assistant Secretary from 1887 to 1916, and as Secretary, on the death of Mr. John Sloughgrove in the latter year, up to the present time. The book is a true record of the public utility of a society which devotes its funds and energies to the encouragement of a recognised British breed of horses, and the Council and Secretary are to be congratulated on the presentation to the public of so complete, useful, and it may be added so necessary a book of reference, compiled, as it is stated, from official minutes, the annual volumes of the Stud Book, and the catalogues of fifty shows.

After quoting the names of the Presidents of the Society from its inception, and the names of those members now serving on the Council and on the various Committees, the context is displayed in chapters as follows:—

(I.) The Shire Horse, origin and use; the Modern Shire Horse; Summary of Standard Points of the Shire Horse (stallions, mares and geldings). (II.) Preliminaries leading up to the formation of the Shire Horse Society. (III.) The King's Champion Challenge Cup. (IV.) The Royal Family and the Society. (V.) The Constitution of the Shire Horse Society; original personnel of the Council and subsequent enlargements, its standing committees, etc. (VI.) Members of Council from 1878 to 1928. (VII.) Membership with Statistics. (VIII.) Spring and Country Shows, with Statistical Details of the Spring Shows. (IX.) The Jubilee Show and Schedule of Prizes. (X.) List of Judges, Stewards and Veterinary Inspectors at the Spring Shows, London, 1880—1929; Champion Stallions, and Champion Mares at the Spring Shows from 1880 to 1928; and Champion Geldings at Spring Shows, 1895—1929; (XI.) Auction Sales generally. (XII.) Spring Sales by Auction, quoting rules and giving statistics, 1884—1928. (XIII.) Auctions other than London, 1896—1921. (XIV.) Country Shows—The Royal, The Highland, Affiliated Shows, and Gold, Silver and Bronze Medals; Shows outside the British Isles; Cart Horse Parades; Awards of Prizes at Country Shows. (XV.) The Shire Horse Stud Book, enumerating entries of stallions and mares, in 50 volumes. (XVI.) Representations on matters of Public Policy, *i.e.*, railway rates, the War, registration of stallions and heavy horse grants, docking of horses, export of horses, horse and motor traffic, condition of the roads, entertainment tax, betting tax, registration of farriers, joint-ill in foals and abortion in mares. (XVII.) Publicity Propaganda and Special Grants. (XVIII.) Outstanding Personalities. (XIX.) Offices of the Society and Secretariat. The volume concludes by 46 pages of an index and chronological synopsis, arranged under 350 special headlines epitomising the scope of the various activities of the Society, a very useful addition for reference and cross reference.

The book is of an especial interest to the veterinary profession, inasmuch as the chapter on the Shire Horse opens with an expression of indebtedness to the late "Mr. R. S. Reynolds, the eminent veterinary surgeon of Liverpool, for many historical facts—the result of his researches and embodied in his 'History of the English Cart Horse.' It forms a fitting prelude to the contents of Vol. I. of the 'Shire Horse Stud Book,' which tabulates the records of 2,381 stallions collated by him after many years' work and research." In the second volume of the Stud Book, Mr. Reynolds, also, in four sections, by essay dealt most thoroughly with the breeding and management of Cart horses. It is of interest, too, to remark on the activities of the veterinary inspectors' associated with the Spring shows and of the procedure in respect to veterinary examination. The veterinary inspectors of very early days included Professor Pritchard, 1880, 1881, 1884, 1886; R. S. Reynolds, 1882; Professor Robertson, 1883, 1885. In the five decades there have been altogether 75 veterinary inspectors. In 1885 two duly qualified assistants were appointed by the chief veterinary inspector to assist him, and "the 1886 Show heralded the arrangements for the veterinary examination, which, with slight modification, have determined the appointment of the inspectors and their duties at all subsequent shows. Briefly, the chief veterinary inspector is appointed by the Council, and he nominates a definite number of names from whom the Council select his sub-inspectors; no animal to be rejected as unsound without the signature of the majority of the inspectors and no horse to be disqualified unless suffering from hereditary disease, the nature of such disease to be communicated to the exhibitor only." The show of 1890 exacted that every entry of animals should be accompanied by a certificate from a duly qualified veterinary surgeon, stating its freedom from hereditary disease. In 1891 the certificate specially set forth that such diseases were roaring, whistling, ringbone, unsound feet, navicular disease, spavin, cataract, sidebone and shivering. In 1892 it was resolved that no animal should be brought before the judges unless it had been passed sound by the veterinary inspectors. In the same year the preliminary veterinary certificate was dispensed with, and the veterinary panel was increased from three to five members, and two signatures were required to reject an animal as unsound. In 1894 it was ruled that only one veterinary surgeon should examine each animal, but two signatures were required to reject an exhibit. A special reservation as to examination of geldings as "working horses" was introduced in 1902. The appointment of veterinary inspectors at the 1906 Show was contingent on their not having examined any intending exhibits before being sent to the Show, which embargo was lifted in 1928. In 1906, too, the appointment of senior officer, which hitherto had been restricted to past or present professors of Colleges, was opened out to Fellows of the Royal College of Veterinary Surgeons. This was further extended to members of the Royal College of Veterinary Surgeons in 1925.

In 1907 it was ruled that yearlings should not be subjected to veterinary examination. In 1912 the present card system in connection with veterinary examination was introduced, and in the 1917 Show it was decreed that all animals should be examined in the same shoes as those in which they are exhibited. The grants by the Society of gold, silver and bronze medals at affiliated shows are contingent on compulsory veterinary examination by local veterinary inspectors, unless animals were passed as sound at the previous London show and official certificates obtained.

An idea of the Society's great national work in the encouragement of our world-famed British breed of agricultural and commercial horses may be gathered from an analysis of money expended. Since the year 1880, the sum of £115,470 has been allocated in prizes in London and in the Provinces; grants for publicity propaganda amounting to £1,500 were made to the United States and Canada in 1920, 1921 and 1922; a gift of Shires to the value of £1,000 was made to the Dominion Government; and to bring the work of the Society before prospective members exhibiting at affiliated shows in this country, £750 has been devoted. In 1915, 250 guineas and 500 guineas in 1919 were donated to the Relief of Allies Fund, £100 to start the National Horse Association in 1922, and what is particularly pleasing to the veterinary profession, the Society showed its appreciation by contributing £100 towards the Re-building Fund of the Royal Veterinary College, Camden Town. In 49 shows the Society has offered four champion cups and thirteen challenge cups for stallions. The original Elsenham Cup (presented by the late Sir Walter Gilbey, Bart.) was won outright in 1891; the King's Champion Challenge Cup for the best Shire stallion dates from 1922. At 47 shows the Society has offered 10 champion cups and nine challenge cups for mares, and 31 champion awards for geldings. A perpetual challenge cup for geldings was given by Mrs. Stanton in 1928, and two champion cups for commercial classes by the Jubilee year President, Sir Walter Gilbey. The value of the prizes offered at the Jubilee Show amounted to £2,300 and the renewal of the prizes and medals at country shows for the year will total £1,200. The aggregate entry for the 49 consecutive Spring shows has been 13,759 stallions, 9,319 mares and 1,043 geldings; 339 horses have been exhibited from 1923 to 1928 in commercial classes; and in the first year (1928) of the Group Produce Class an entry of 81 by 15 registered sires was catalogued. The scheme of Produce Group Classes has been extended to affiliated shows.

Coming to the Shire Horse Stud Book, with the issue of the fiftieth volume, registration numbers have been allotted to 40,449 stallions and 122,739 mares. The first volume contained the pedigrees of 2,381 stallions foaled previous to 1877, and the conditions of entry stated "that no horse be admitted into the Stud Book, having a cross of any other breed than that of an English Cart Horse for at least two generations." Mention is made of a chronological list of stallions in the appendix of the Stud Book bearing dates of stallions as far back as 1770 (*e.g.*, Blaze, and "The Packington Blind Horse"), and a service card of a travelling stallion in 1812 is displayed. Mares were first admitted to registration in Vol. II. (1881) provided they had at least one cross of registered blood. Yearling colts were admitted to registration in Vol. III. (1882). The conditions of entry were from time to time tightened up, until in February 1920, "it was decided that in Vol. 45, mares

foaled in 1922 or after must have four crosses of registered Shire blood on the side of the dam . . . its object was to exclude in the future the possibility of the foundation animal being of any other than the 'Shire' or 'Old English Breed.'" Systematic nomenclature by prefixes and affixes was inaugurated in 1892, and the latest issue of the Stud Book shows lists of 3,632 registered prefixes and 153 registered affixes. Identification with a particular stud is facilitated thereby. Vol. 42 (year 1921) marked the greatest number of stud book entries in any one year, viz., a total of 7,620, comprising 1,021 stallions and 6,599 mares. The statistics dealing with the prices realised at the Spring Show auctions, and replenishing or dispersal sales at auctions other than London, are interesting reading. The year 1920, immediately following the War, was peak year at the Spring auctions, London, when £4,830 was given for a mare (Gleadthorpe Seclusion) and £2,625 for a stallion (Ansty Forest Clansman), a similar price for Lincoln John being given in 1919. These may be contrasted with the extremely low prices of 1924 at £210 as the highest price for a stallion and £115 10s. 0d. for a mare, the situation no doubt being evidence of the serious blow to heavy horse breeding occasioned by the temporary withdrawal of Government grants for the years ending March, 1923 and 1924. The highest price for a stallion realised by auction other than London was 4,100 guineas for Lord Rothschild's Champion Goalkeeper in 1913; five others have realised amounts over 3,000 guineas, and 33 altogether have realised 1,000 guineas and over. Fifteen mares have realised 1,000 guineas and over at public auction other than London, the highest being Snelston Lady, 2,200 guineas, from the Pendley Stock Farms. The highest price ever given for a foal by public auction was a colt by Champion's Clansman at 1,250 guineas in 1919, and 14 foals are recorded as realising 400 guineas and over.

Naturally a recital of the progress and success of the Society would not be complete without mention of those outstanding personalities and particularly those pioneers on whose faithful service and extreme generosity the fortunes of the Shire Horse have so much depended. Space will not admit of allusion to the many names of noblemen and gentlemen prominently identified with the breed and the Breed Society, but enshrined in its annals and standing out like a beacon light weathering the storms of controversy, and proof against all difficulties, is the name of Gilbey, and it is a fitting tribute to the son of a great father that he should occupy the Presidential chair in the Society's Jubilee year. The book furnishes a very valuable addition to equine literature and its purchase is strongly recommended for both private and public use. Copies may be obtained direct from the Secretary of the Shire Horse Society, 12 Hanover Square, London, W.1., at the price of one guinea, or at half a guinea in the case of members of the Society. It is also obtainable on application to the principal libraries. J. M.

Personal.

Will. Macgregor, Mr. William Alexander, M.R.C.V.S. (57), of Wellwood, Castlehill Road, Ayr, veterinary inspector to the Burgh of Ayr (i addition to considerable real estate, personal estate in Great Britain), £44,899.

DIVISIONAL REPORT.

Yorkshire Division, N.V.M.A.*

President's Address to the Annual Meeting.

The Annual Meeting of this Division was held at the Hotel Metropole, Leeds, on Friday, February 1st, 1929, the Chair being taken by the President, F. C. Scott, Esq. (Pontefract).

There were also present:—Messrs. Woodrow, Angler, Sampson, Robinson, Pollard, Gaunt, Gentle, Halilay, Proctor, Campbell, Smyth, Secker Smith, J. McKinna, Bowes, Livesey (Hon. Associate), Barber, Rabagliati, Herd, Holland, W. Ackroyd, S. McCormick and E. Ackroyd.

Apologies for absence were received from Messrs. W. McKinna, Abson, Wharam, Noel Pillers, Carter, Bolton, Fletcher, Clarkson, Dixon, McCleery and Dr. O. Charnock Bradley.

The minutes of the last meeting having been published, it was agreed that they be taken as read.

On the motion of Mr. J. McKinna, seconded by Colonel Bowes, it was resolved that the Hon. Secretary be requested to write to Mr. J. Clarkson (Garforth) expressing sympathy with him in his prolonged illness and hopes of his speedy recovery.

N. V.M. A. Council.—A letter was read from the N.V.M.A. on a proposal to add a further twenty-five representatives to the existing Council.

It was proposed by Colonel Bowes, seconded by Mr. McKinna, and resolved:—

> "That this Society is in favour of the suggested increase in representation, but considers that this should be carried out by an alteration in Article 59, Clause (b) to read:—
>
> 'Representatives from each Division of the Association, namely, the Honorary Secretary and one for every twenty-five members or a portion thereof.'"

Elections to Membership.—The following were unanimously elected members of the Division:—Messrs. S. Sharp (Tadcaster), A. D. Kerr (Huddersfield), W. A. Ireland, J. Herd (Howden), and John Porter Cook (Market Weighton).

R.C. V.S. Council Election.—The Division agreed to support the candidatures of Mr. J. McKinna and Major D. S. Rabagliati at the forthcoming election to Council, R.C.V.S.

Presidential Address.

In presenting his address from the Chair, Mr. F. C. Scott said: In the first place, I desire to thank you for the honour you have conferred on me by electing me President for the coming year.

It was not with a sense of competence for the office that I accepted it, but as an opportunity to serve the Society in return for the many pleasures and privileges I have derived from membership. I recall the old saying: "He that is chief among you, let him be your servant," and I hope as President for the coming year to be able in some measure to do this.

* Received on 23rd March, 1929.

When I recall the names of many past presidents of this Society, I find among them eminent men who have served the Society and the profession well, and I feel the office is no sinecure.

Many years ago, a veterinary society appointed a President who gave a presidential address; he being a man of ability, it was no doubt a success, but I am sure he did not realise that he had established a precedent as, ever since, veterinary societies have had presidential addresses. Had that pioneer thought of the difficulties which might confront future presidents, he would probably have shown forbearance. But, be that as it may, societies will continue to bear or enjoy these addresses *ad infinitum*.

When one realises that this society has existed since 1863, it is not unnatural to ask, what has kept it alive? There must be an answer.

My own experience of this society as a member is of less than ten years standing, but I must admit a great debt to it and its members.

Joining as quite a young graduate, my first impressions were those of a great willingness by the older members to assist me in difficulties by generous advice, and to discuss matters, clinical and otherwise, pertaining to the profession.

Secondly, a review of only a few years' work of this society will show a large number of subjects discussed. We have had three or four papers annually, apart from impromptu matter brought up under the heading of "Interesting cases." Over a period of years one may refer to the doings of a society as a "course for practitioners." It has been said by some that all that goes on at a meeting can be read in the weekly journal by the fireside, but there is a great difference. We all know that far more useful information is retained from a discussion at a meeting than from volumes of reading matter. We have had many demonstrations and *post-mortem* specimens.

Few members, if any, will disagree with my assertion that these meetings have a great educational value.

But there are other and greater considerations than these. There is an atmosphere of fellowship and goodwill in a society such as this, created by the meeting of members on purely professional and social grounds as contrasted with the considerations which may bring us into contact or conflict in the course of the daily round.

The outcome of these meetings is that the members have opportunities of becoming well acquainted with their colleagues, and establishing a broad understanding and confidence in one another, which helps, particularly in difficulties and disputes which do arise both privately and publicly.

In other words, the society has an ideal and it is perhaps best epitomised in the R.C.V.S. motto: "*Vis unita fortior*."

Taken generally, a veterinary surgeon's life is a hard one and to make a reasonable living he has to work assiduously for long hours and, unfortunately, in many cases, has not the leisure he deserves. Ours being a small profession and widely distributed, many members must of necessity be a long distance from the centres where society meetings are held, but experience has shewn to those who have enjoyed membership of a society that the effort to attend the meetings is very well worth while. The more we put into things the more we get out of them. If we wish to learn, there is no humiliation in coming to listen or to enquire. If a man has superior knowledge it is his privilege and, in a sense, his duty to be able to pass it on.

I might mention, in passing, that we have a membership of about eighty members—a good membership, but we would all like to see more, as there are no doubt many members, possibly with great difficulties so far as distance is concerned, who are missing something worth having and who would at the same time be an asset to the society.

Dr. Bradley, the President of the N.V.M.A., when here three months ago, urged us to increase the membership of the National V.M. Association, in order to increase its authority and to make it representative of as many members of the profession as possible. Many are the times when measures influencing the whole profession are at issue, and only by having a really representative body at such times can the profession truly speak for itself.

Professionally times have changed very much in the last decade, so far as veterinary employment is concerned. The Great War, perhaps, gave us a little publicity as a profession; since then we have been in the public eye; little by little our members have proved their worth and fitness to do veterinary work of a public health nature.

Perhaps a higher standard of education would have given public authorities greater confidence, at an earlier date, in instituting public health measures involving the animal kingdom as a possible source of disease to mankind.

The R.C.V.S., whom we frankly admire, have had this side of the profession's welfare at heart for a long time, as evidenced by their establishing courses for the D.V.S.M. and the D.V.M.

Recognition—one might almost say full recognition—has come at last. Municipalities and County Councils on a wide scale have their veterinary departments established and it is up to those holding appointments under them to give good public service; their future will be assured.

We have had the pleasure recently of some of the gentlemen so employed, joining this Society. We welcome them and hope the fellowship of this Division will facilitate their duties. We also hope they will soon have a wealth of veterinary information at their disposal from which they will occasionally give contributions here.

We hope this society will always be sufficiently wide in its scope to comprehend all legitimate veterinary interests, however diverse they may be.

Veterinary research has also received a great impetus in recent years. Trained research workers have been forthcoming, have acquitted and are acquitting themselves with credit to the profession.

The future of the practitioner is perhaps less clear than that of those in other forms of veterinary employment. One hears of less work to do, lower fees and increased competition by the unqualified, organised and otherwise. The wider enlightenment of the agriculturist, with whose prosperity we are wrapped up, and the application of more rational and efficient methods of prevention of disease, are bound to affect us adversely. Some practitioners have suffered heavily by the inevitable trend from part-time to whole-time official employment.

XUM

Progress lessens the calls made on us, so that other channels have to be sought as an outlet, or else fewer men will be needed for general practice.

Canine work has increased as an offset to the dwindling number of town horses. In the purely country areas, a livelihood is only to be made by spending long hours, travelling long distances and by a wonderful tact and patience to meet the "hard knocks" to which the late President of the N.V.M.A., Mr. McIntosh, referred in his Presidential Address. Difficulties in diagnosis, prejudices and the incorrigible tamperings with the mysterious both in the way of knowledge and medicines make our calling extremely interesting and hold us up many a time to be shot at.

Whatever fees individuals may charge, there seems to be a "shaking down" in conceptions as to what certain classes of work are worth, and if, at that rate, a professional man is badly paid, his status suffers. In one sense our status is made for us, but everyone can influence to a marked degree what status the public will grant him.

The general education before specialising as a veterinary surgeon is a vital point. Many clients judge on personality first and qualifications afterwards.

Again, the R.C.V.S. have the supply of an adequate number of private practitioners at heart and realise that too high an educational standard would probably increase unqualified practice, especially as there is a limit, in the majority of instances, to the emoluments to be earned in private practice.

Were the raising of the educational standard contemplated, I believe the present time, when the choosing of careers for boys is so difficult on account of so much overcrowding in most professions, would be an opportune one.

We will not altogether admit that ordinary practice demands diverse qualities in a man from those demanded of the more technical worker; yet the more technical a man's training, the less is he inclined to the rough usages of general practice. There is something wrong when we hear that so many new graduates never intend to take up private practice; and additionally, I think, we can safely say that the average new graduate at qualification is better equipped for a research or public health career than for general practice. This implies a need for more practical training prior to graduation, and so long as the one diploma comprehends the licence to practice all forms of veterinary science, all students should submit themselves to an approved pupilage. Fortunately, many students acquire practical training on their own initiative, and but for them the R.C.V.S. would have had their hand forced to turn out a more practical standard of practitioner.

Having criticised the recent graduate, I think it only fair to say that graduation is only the beginning and not the end of a professional career. Much of the fate of a veterinary surgeon depends on his powers of diagnosis. There are limits in many cases to our powers in this respect, especially if we leave out "shrewd guessing"; unless the spirit of enquiry is kept alive and we keep conversant with the book shelf, there is a tendency to get into routine and apathetic methods.

It is always a pleasure to hear a paper on diagnosis and its difficulties, and I hope this society will continue to foster a desire for such papers.

The practitioner is likely to remain the backbone of the profession and his future to be what he makes it for himself. He has much scope for sifting the chaff from the grain in new ideas. Given enterprise, many are the new methods which he must introduce to keep alive and abreast with the times. But for the introduction of greater refinements in diagnosis and the application of new lines of treatment, there would be nothing to replace the patients of yesterday. In the clinical field, with sporadic diseases we cannot widen our scope except by perfecting our knowledge. There are still fields comparatively unexplored.

Enquiries in connection with sterility in cattle come along, and unless we are prepared, we find it easy to pander to popular ideas and dissuade a half-hearted but hoping client.

In surgery we have opportunities of rendering really useful service to our clients; such operations as "removal of the claw in cattle," and "Hudson's teat sphincter operation," which give almost immediate relief, are simply performed and bring about a quick recovery.

The use of the wire saw and the more extended use of general anæsthesia in obstetrics have simplified matters considerably.

Perhaps mastitis is the worst condition with which the cattle practitioner has to deal. Present treatments are so unsatisfactory; the condition persists often for months, keeping the animal in a poor condition, and the outcome is one or more functionless quarters.

Would it not be worth a trial in these cases, once having decided that a quarter will ultimately be functionless, to cut off the blood supply by ligature, and so kill the useless member quickly? I have seen a few cases where an acute mastitis has occurred and necrosis of the whole quarter has followed. When the quarter has fallen out or has been removed by incising the skin, the wound has healed quickly and simply.

We can still render many useful services in connection with contagious diseases.

Swine fever serum inoculation can, I think, be classed as an economic and useful measure, its chief use being in the incontacts, but unaffected.

Swine erysipelas serum inoculation is another useful treatment for owner and practitioner.

Abortion is a disease in which we can be useful, but anything we may do is lost sight of unless statistics are kept. The prevention of this disease is asked for when evidence of the arrival of the disease is present and so often the damage is already done. Disinfection of discharges and isolation are essential and in some cases strict attention to these has lessened the spread of the disease.

Sheep are subjects to which we are now called more than before and it is surprising how gratifying it is to a practitioner to hear that his treatment for parasitic gastritis has stopped the death rate.

Distemper has been a "box of mysteries" so far, but we hope that recent and future discoveries will place means for its successful defiance in our hands.

This, of course, does not complete the list, but it is just an indication of some of the openings available to us which can be allowed to pass by with loss to our clients and ourselves.

There are many aspects of veterinary science upon which one might have touched, but I feel guilty of having occupied your time too long, for which I ask forgiveness.

This society, since I have known it, has always been an active one; no society can march this year on last year's laurels, so that I hope every member will do his best and attend this year. Interesting cases will be particularly welcome and, incidentally, will help to increase the society's usefulness. I thank you, gentlemen.

In moving a vote of thanks to the President for his address, Mr. BOWMAN said that it had afforded him great pleasure, and there was a great deal in it that deserved consideration.

Major RABAGLIATI seconded, remarking that the address had brought every branch of the profession under survey. They all knew what a great interest Mr. Scott took in veterinary matters generally, and he deserved every credit for the position they had so worthily given him.

The vote of thanks was passed with applause.

A discussion followed upon a letter received from the N.V.M.A., *re* the provision of free veterinary treatment for sick animals of the poor. The meeting approved of the principle of the draft scheme which was the subject of the letter, and also of the suggestions relative thereto, subsequently forwarded by the N.V.M.A., which had been drawn up by a member of the profession.

In concluding the meeting, the PRESIDENT said he could not allow the opportunity to pass without acknowledging the presence of Mr. Livesey, who was one of their Hon. Associates. They did not make many Hon. Associates, and the few they had were exceptionally well selected. On behalf of the members he expressed their pleasure in having him amongst them. (Applause.)

T. C. HALL, *Hon. Secretary.*

From The Veterinarian, April, 1828.

On Veterinary Medical Societies.

Sir,—The veterinary profession is much indebted to you for establishing, through the medium of your journal, a communication between its members. The discoveries and improvements which will be daily made in an infant art may be widely disseminated, and those errors detected which must necessarily attend us until we are fairly emancipated from the thraldom of ignorance and empiricism.

Something more, however, is wanting if veterinary science would attain that perfection at which we are beginning to aspire. In large towns and populous neighbourhoods, and especially in the metropolis, veterinary surgeons should be brought into nearer contact with each other. The peculiarities, and advantages, and defects of the practice of each would then be discussed and turned to mutual advantage. A friendly connexion and feeling would be produced and encouraged. Little jealousies, and misconceptions, and misrepresentations would cease to divide and injure us. We should become more identified with the common interest and respectability of our art; and we should form that bond of union, which would, in spite of apathy or interested opposition, secure the rapid advancement of veterinary science.

The London Veterinary Medical Society is an excellent institution of this kind; but it is principally confined to pupils. It is adapted to their situation and wants. It is contrived to put to the test their knowledge of minute anatomy, and the grand principles of physiology and pathology; and if those only whose studies have prepared them for the subject would join in the discussion, the advantage to be derived would be very great.

Gentlemen who are established in their profession may have forgotten some of the steps by which they obtained enlarged and accurate views of practice, and may not choose to be cross-questioned by youngsters, whose attention is properly directed to the objects which border the path they are compelled to climb, but who have not been cheered with the sublime prospect to which that path conducts.

Whether it may be possible so to modify this truly valuable institution as to allure the established practitioner without sacrificing the interest of the pupil; or, whether it may be advisable, in a more centrical situation, to found a society of practitioners, on the plan of the London and Westminster Medical Societies, but to which respectable students may be admitted, are questions that may deserve consideration. There cannot, however, be a doubt that, next to the diffusion of a liberal veterinary journal, the periodical meetings of veterinary surgeons would essentially promote the cause we have at heart.

I trust some veterinarian, of greater weight than the humble individual who now addresses you, will exert himself in accomplishing this most desirable object. An ardent spirit of enquiry begins to actuate the members of our profession, and it will be our own fault if we attain not that estimation which the importance of veterinary science justly claims. T.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Aug. 31st to Sept. 6th.—N.V.M.A. Congress at Ayr.

April 22nd.—Meeting of the Editorial Committee, N.V.M.A., 10 Gray's Inn Square, W.C., 4-30 p.m.
,, 26th.—Meeting of the Royal Counties' Division, N.V.M.A., at Guildford.
,, 26th.—Meeting of the Yorkshire Division, N.V.M.A., at the Hotel Metropole, Leeds, 3-30 p.m.
,, 30th.—Last day for payment of Annual Fees to R.C.V.S.
May 3rd.—Annual Meeting and Dinner of the Lancashire Division, N.V.M.A., at the Midland Hotel, Manchester.
,, 9th.—R.C.V.S. Council Election—Last day for Nomination of Candidates.
,, 18th.—Entries due for D.V.S.M. Examination.
,, 23rd.—R.C.V.S. Annual Report and Voting Papers issued.
,, 30th.—R.C.V.S. Council Election—last day for receipt of Voting Papers.
June 6th.—R.C.V.S. Annual General Meeting.
,, 17th.—D.V.S.M. Examination commences in Edinburgh.
July 3rd.—R.C.V.S. Annual Dinner.
,, 4th.—R.C.V.S. Committee Meetings.
,, 5th.—R.C.V.S. Council Meeting.
,, 9th.—R.C.V.S. Written Examinations.
,, 11th.—R.C.V.S. Oral Examinations begin.

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The Buff Book.

The publishers of the Buff Telephone Book of classified telephone entries appear to have addressed to all telephone subscribers an enquiry asking whether they would not prefer the insertion of their name to be in bolder type at an extra charge which varies according to size of type used.

If this has been received by veterinary surgeons, they will remember that to authorise and pay for a display of their name, qualification and address would be a form of advertising and as such a breach of the Byelaws of the College. (See Byelaw 53, Register page 68.)

R.C.V.S. Obituary.

Richardson, Frank, 78 High Street, Sydenham, London, S.E.26. Graduated, Edinburgh, 22nd December, 1896. Died, 9th April, 1929, aged 56.

Williams, Thomas, Whitland, Carmarthen. Graduated, London, 4th January, 1884. Died, 7th April, 1929, aged 68.

The Late Lord Northbrook.

We regret to record the death from influenza and bronchitis, at the age of 78, of Lord Northbrook, at his seat Stratton Park, near Winchester. He will be long remembered and most seriously missed as an agriculturalist and stockbreeder of exceptional merit.

Lord Northbrook was intimately associated with the Royal Agricultural Society, the Royal Counties Agricultural Society, the Shorthorn Society, and the Dairy Shorthorn Society, and for many years was President of the Board of Governors of the Royal Veterinary College, Camden Town. Whenever veterinary matters had to be adjusted and elucidated he was ever to the fore. He formed a very useful link between the Royal Agricultural Society and the veterinary profession, both for research and experimental work, as he was always well versed in matters appertaining to the health of farm live stock.

Tuberculosis in Pigs.

At a meeting of the Council of the National Pig Breeders' Association held in London, it was reported that consideration had been accorded to a suggestion that the Association should hold a show and sale at Edinburgh in the autumn of 1929, when the Secretary had reported the result of inquiries made of all Scottish members. The General Purposes Committee recommended that, having regard to the nature of the replies, it would be preferable to hold the show and sale in the Spring of 1930.

The effect of feeding milk to pigs from tuberculous cows had received further attention, and while the Committee appreciated the danger of feeding fresh milk or separated milk from tuberculous cows or from cows which were not known to be free from tuberculosis, they did not think it necessary to recommend that further experiments were necessary on this point. It was felt that the infection of pigs in the past had been largely due to the fact that they were given milk or whey which could and did produce tuberculosis. The amount of infection was further increased by the insanitary conditions under which they were kept, and tuberculosis would disappear from pigs just in so far as this source of infection was removed. Arrangements had been made for an authoritative leaflet on the subject to be circulated drawing attention to the importance of this question.

The Committee's report was adopted.

The Scotsman.

The Sheep Scab Position.

At a recently-held Council meeting of the Royal Agricultural Society a report was presented to the council as the result of a conference between representatives of the Society, the National Sheep Breeders' Association, and the Minister of Agriculture and Fisheries, in which the present position of sheep scab was deplored. The conclusion had been arrived at that it was only by educating public opinion to the seriousness of the disease and the absolute necessity of eradicating it from the flocks of this country that any improvement in the position could be obtained.

Royal Veterinary College Rebuilding Fund.

In connection with the national appeal on behalf of the Royal Veterinary College, London, Capt. and Mrs. Claude Ewin, of Coombe Brook, Coombe Lane, Kingston, are giving a garden fête and party in their grounds on July 6th. The effort is receiving the patronage of the Mayor and Mayoress of Kingston (Councillor and Mrs. W. E. Blake Carn), Lord and Lady Ebbisham, Lady Burge, Sir Arthur Glyn, Sir Harry Renwick, Sir Thomas Inskip, Mr. F. George Penny, M.P., and Mrs. Penny, Alderman and Mrs. W. W. Scott, the Rev. and Mrs. Wellesley Orr and Mr. Leonard Bentall, J.P.

A drawing room meeting, with the object of making preliminary arrangements, was held at Coombe Brook on Monday, Capt. Claude Ewin presiding, when amongst those present were the Mayor of Kingston, Professor F. T. G. Hobday, C.M.G. (Principal of the College), Mr. T. C. Wight (Secretary of the College), Capt. and Mrs. Collins, Dr. and Mrs. Harry Wadd, and Mr. and Mrs. Surry. The duties of hon. secretary were undertaken by Mrs. Ewin, of Abbotsmead, Kingston Hill, and those of hon. treasurer by Mr. Burge.

Professor Hobday gave an interesting account of the work of the College.

The Surrey Comet.

Shire Horse Society.

At a meeting of the Council of the Shire Horse Society held in London, Sir Walter Gilbey, the retiring president, and chairman of the Finance Committee, said that the financial position of the Society would require very serious consideration when they entered into big schemes of expenditure because they were gradually encroaching on their reserve fund. The present position had been brought about, of course, by the distress that had overtaken the agricultural industry.

It was stated that representations had been made by the Council to the Ministry of Agriculture indicating the need for an increase of heavy horse grants, and pointing out that the decrease in the breeding of heavy horses in recent years had been very sharp, with the almost certain prospect that a very serious shortage of horses, not only for town users but for farm work, would be felt in a few years. More encouragement to owners now, it was added, should prevent the coming shortage of heavy horses being so acute. The Council pointed out that, in contrast to pre-war days, the heavy horse breeders of to-day were almost entirely tenant farmers—a class which was feeling acutely the depression in the agricultural world. The Ministry of Agriculture had replied that they would give full consideration to the representations of the Council, but that it was quite impracticable to give effect to them for the present season.

Mr. Thomas Loyd (Berkshire) was elected president of the Society and Mr. David Davies, M.P. (Montgomeryshire) president-elect. Mr. A. T. Pidduck (Cheshire) was elected steward for the spring show.

Isolation of the Active Principle of Tuberculin in Crystalline Form.

The specifically active substance in tuberculin responsible for the production of the typical skin reaction is a water-soluble, coagulable protein, of the nature of an albumin. It is stained by methylene blue, and contains the ordinary amino groups, but no carbohydrate. It is crystallisable by the method of Hopkins at an optimum *p*H of 4.9. Even after 14 crystallisations the protein gave the typical skin reactions and caused atrophy of the testicle of a tuberculous guinea pig. The crystalline substance obtained after ten

recrystallisations was found to be twice as active as the original fraction from which it was obtained. It is, however, very unstable and quickly loses its activity.—Florence B. Geibert (*Amer. J. Tuberculosis*, 1928, 17, 394; through *Chem. Abstr.*, 1928, 22, 2197).

Mr. Gullett, the Minister for Trade and Customs, is withdrawing permits for the export of Australian birds. Exceptions are made in the case of zoological collections, and for birds intended as ships' pets. He bases his action on his distress at seeing hundreds of caged birds in pitiful conditions in Islington markets.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Milk Fever.

To the Editor of The Veterinary Record.

Sir,—The controversy taking place in your columns regarding milk fever is very interesting, but it is very difficult, from all the different theories advanced, to concoct a plausible tale to tell the owner when he finds his cow rocking about or on the floor from no apparent reason.

I agree with Mr. Spicer that it never appears in first or second calvers, and I think this fact is the most difficult to explain. One constantly sees big, heavy-milking, second-calf cows go on all right, and in an adjoining stall a very moderate milking third-calver go down.

I have frequently been told by the owner of a cow with milk fever that she is a second calver, but on enquiries find that he cannot prove it, as he has bought the animal. I do not believe that anyone, no matter how great his experience, can say whether a cow is a second or a third calver by looking at her. Last July I was asked to attend a fat heifer found down that same morning. She was unconscious and I told the owner that her symptoms were typical of milk fever. His answer was "Well, she cast a calf about the size of a hare yesterday morning." On closer inspection I found she was not so much of a heifer as she looked. Her horns had been scraped and polished, and she showed a full mouth. She was bought amongst a lot of supposed maiden Irish heifers for fattening purposes a few months before. It was quite possible that this was her third calf. She never had been a milker and showed no sign of milk now. The only treatment given was inflation and very little air sufficed, as she had little or no udder. Within two hours she was conscious and was soon up and away as if nothing had happened.

I frequently get milk fever after abortion when the cow has little or no milk in her.

The swelling of the udder so often seen in first- and second-calvers, known in this district as "Ellering," reaches an alarming size at times. It is difficult to say that the great swelling and intense pain are all natural, and it is a question whether any attempt should be made to give relief. I have never seen this condition in a third calver. Many owners consider this a sure indication of a heavy milker, but I think it is seen more in the cross-bred Shorthorn type of cattle than in the Jersey or Friesian type.

I find that some owners who use their own pump often have their animal down for two or three days; this is due probably to the animals not being pumped up tight enough at first. Some repeat the process twice a day until they get up. In those cases one generally finds air under the skin, often right up the loins and shoulders.

Yours faithfully, Wm. A. Campbell.

Boroughbridge, Yorks.
April 6th, 1929.

(I) Milk Fever; (II) Sidebone and Lameness.

To the Editor of The Veterinary Record.

Sir,—The various theories put forward as to the cause of milk fever are, to me, difficult to square with the general rule of three—it never occurs before the third calf, usually before the third day after calving and never after the third week. Those cases which do occur after the third week can be classified as atypical cases of milk fever, and of these I have had several during the last three years.

I have never seen a case of milk fever in a second calver, and the only thing which would convince me, apart from knowing the particular animal from birth, would be the age—presuming, of course, that she had conceived at eighteen months of age.

I am very anxious to see some of these things we read about, and would not mind going a reasonable distance to do so. Until we know something about the pathology of milk fever we are not likely to find the cause, and this seems less hopeful now that the mortality is not more than two per cent., if as much.

The question as to whether sidebone does or does not cause lameness is still unsettled. I have been seeing practice for thirty-three years, and I have yet to see the horse which is lame from sidebone. I must qualify this by saying that I mean sidebone absolutely and not sidebone associated with any other pathlogical condition. At a meeting of the Mid-West and South Wales Division a few years ago I asked the members present to let me know when one of them should come across a sidebone lameness and I would willingly go and see it. The question could be settled by buying the animal (they were at quite a low price then) and, after slaughtering, submitting the part to a pathologist. Why not solicit the opinion of Mr. Henry Sumner, who is a past master on lameness in heavy horses—clinically, physiologically, and pathologically,—and abide by his decision? Yours faithfully, J. P. Railton.

Ashfield,
Builth Wells.

Hysteria in Dogs.

To the Editor of The Veterinary Record.

Sir,—I have been greatly interested in the discussion upon hysteria in dogs. From my experience of the disease in this town I have definitely come to the conclusion that it is not due to an organism, but is what may be called (for want of a better term and to hide our ignorance) a "neurosis." It is especially common in animals of the very popular breeds, owing to constitutional defects brought about by in-breeding. Many of these animals would be in mental homes if they were human.

I have derived much amusement and perhaps a little instruction from a study of the alleged exciting causes in various dogs. The owner of an old Irish terrier formed the opinion that fireworks and earthquakes were responsible in his case. A loud-speaker of considerable power was alleged to have been the start of the complaint in an Airedale pup. A fall into the sea was followed by great nervous irritability, bordering on mania, in a Cocker spaniel. A hysterical lady had three hysterical bitches, one after another. Exercise, prolonged beyond the usual time, in busy streets or among rat and rabbit holes, has been followed by attacks.

Another point of interest is the alleged connection between distemper and hysteria. I do not think there is really any connection between the two, but of course distemper or any other disease may bring about mental stress which exhibits itself in the form of hysterical spasms. Several times have I met with puppies with the preliminary symptoms of distemper, but which in a day or two have become hysterical, with normal intervals.

Fortunately, the treatment is easy and cheap. The bromides of sodium, potassium and ammonium, with morphine at the time of the greatest excitement, seem quite sufficient. They can be given in doses of 5 to 10 grains three times a day. The ammonium salt, being the least depressant, is to be preferred in the more delicate breeds. With regard to morphine, the large doses so often prescribed are not necessary. As a matter of fact, it is my usual practice to give quite small doses of all medicines to dogs and the desired effect is produced. I would go further and say that generally the amount to give is none. As a tonic after the excitement has gone I prescribe

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strychnine in the shape of compound syrup of hypophosphites or glycerophosphates. The dosage here of strychnine is quite minute. Easton's syrup occasionally forms the basis of my tonic mixture, one drachm in two ounces of chloroform water. Dose, one teaspoonful. By experiment I have ascertained that a two-ounce vial contains twelve average teaspoonsful, so that when prescribing I bear this in mind and prescribe the drugs accordingly.

If I had not taken up so much space with this letter I should like to refer to the importance of a thorough overhauling of canine posology, and also to the matter of the prescribing of proprietary articles of more or less unknown composition by practitioners. But I am sure I meet with your approval in refraining.

Yours truly, BERNARD GORTON.

Bournemouth,
14*th April*, 1929.

Johne's Disease.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In the *Veterinary Record* of April 6th, page 285, Mr. Fletcher gives some valuable notes regarding an outbreak of Johne's disease; there are, however, certain points on which comment may be made.

Five cases are described, but no mention is made of the size of the herd or of the total number of animals exposed to similar conditions.

The author says: "We found that infection had been brought on to this farm during the past year, as no case of Johne's disease had been noted at this place before." If that were so, it would be extremely interesting and would support the view that the stagnant water had possibly acted as a non-specific contributory cause. Is it not more likely that infection had occurred at some time previous to 1927 and that the pond had been a fertile means of spread? The water, from its contamination by fresh droppings and by washings from the manure heap, would be an ideal centre for infection. Such a view is supported by the general evidence regarding the long period that elapses before the introduction of an infected animal to a clean farm is followed by an "outbreak," and by the evidence, particularly of German workers, that drinking-places are a fruitful source of spread. It would be useful to know at what age calves began to use the pond.

The age of the affected animals is interesting, in that all were under four years and three were two years of age or less, facts that may be interpreted as due either to the ingestion of a large number of bacilli or to their ingestion at an early age. It would be of value to know precisely what was the chance of infection of the younger animals during their early life at the farm or elsewhere. The writer realises that no disease had been recognised on the farm previous to November, 1927, and the results of the general johnin test support the view that infection was probably of recent origin.

Regarding the age of infection in Johne's disease, nearly all experiments have been carried out on animals aged about one year or less; in them, even after large doses of infected material or doses up to 1,000 mgms. of artificially cultivated bacilli, given by the mouth or intravenously, less than a half showed evidence of disease when killed one to two years later. In the latter the disease was not of a clinical character, but still in the incubative stage, and lesions were often of slight degree. The existing experimental evidence tends to show that the young calf is the most susceptible bovine animal. The incubation period in natural cases would in all probability be much longer, particularly if infection occurred after the early months of life. There is, however, some difficulty in accepting the view that early infection is the rule, because on many farms calves a few weeks old are kept quite separate from the older animals and continue to be so kept for the first two years.

Information is urgently needed regarding the precise history of naturally-affected animals, and the effect of age on the possibility of infection and the period of incubation; also concerning the stage at which the double intradermal test, the one now most commonly used, will detect preclinical infection.

Yours faithfully, A. W. STABLEFORTH.

Research Institute in Animal Pathology,
Royal Veterinary College,
Camden Town,
London, N.W.1.
April 9th, 1929.

A Good Larvicide.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I believe that in general the occurrence of "maggots," or fly larvæ, in wounds is becoming an increasingly serious problem, particularly in Africa. As far as I am aware, no simple but effective dressing for treatment of this condition is widely known.

Turpentine is such a substance. It is best applied by use of tow, cotton wool or stringy tobacco, which has been soaked in it, packed tightly into the wound after that has been cleaned up in the usual manner. After a few hours one removes the packing and treats as an ordinary infected open wound. As turpentine has antiseptic properties besides the larvicidal action, one is simultaneously benefiting the wound. Neem oil (Murgoza oil) is not so good. Turpentine is the only satisfactory dressing I have yet seen or heard of.

Before packing we here usually extract all the larvæ that can be got at without doing unnecessary damage, with fine-pointed forceps, and after removal of the packing we syringe out freely to remove the dead larvæ.

I am indebted to my Assistant Veterinary Surgeon, Mr. Y. G. Shanta, for bringing to my notice the value of turpentine in this connection. G. B. PURVIS, F.R.C.V.S.

Taiping,
Perak, F.M.S.

Tuberculosis in Dairy Cows.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I notice in the issue of *The Veterinary Record* of April 13th, under the heading "Herts' Proud Record," an extract from some report of the annual meeting of the Hertfordshire Milk Recording Society. It is stated that as the result of 24,741 examinations of 6,000 cows, only twenty-seven were found to be tuberculous.

Such unqualified statements made to the public are, to my mind, most unfortunate as they are liable to give rise to a sense of false security and very likely make them believe that routine veterinary examination of dairy cows is unnecessary.

It would be interesting to know what kind of an examination was carried out—whether of the cows or of their milk; if of the cows, whether by a member of the veterinary profession, and if of the milk, whether the biological test for tuberculosis was resorted to. It is possible that the twenty-seven tuberculous cows referred to were those coming within the scope of the Tuberculosis Order, 1925: a totally different thing from those actually affected.

Yours faithfully, D. S. RABAGLIATI.

County Hall,
Wakefield.
April 16*th*, 1929.

Three-Teated Cows.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—With reference to cows being born with only three teats, I have got a Friesian heifer (just calved her first calf) which has only that number of teats.

Yours faithfully, GRAHAM REES-MOGG.

April 15th, 1929.

The Editor acknowledges the receipt of the following:

Communications from Dr. Tom Hare (London), Messrs. C. M. Haring (University of California), R. W. Lewis (Campbeltown), W. Tweed (Sheffield), and W. R. Wooldridge (Cambridge).